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PIT AND QUARRY

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SEPTEMBER, 1941

New Recovery Methods Make Reprocessing of Tailings Profitable . . . Photomicrographs Help to Sell Proper Grade of Sand . . . Truck-Trailer Trains Bring Aggregates to Plant

LUDLOW-SAYLOR

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

for super-severe service

●

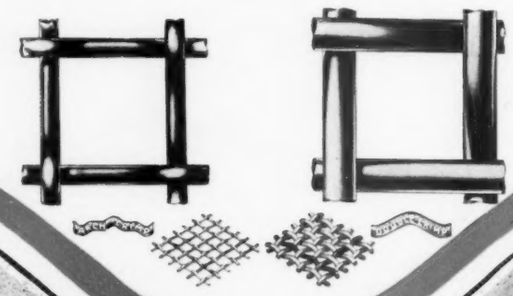
SUPER-HARD, SUPER-TOUGH, SUPER-STRONG

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

withstand abrasion longer—

endure vibration better—

resist fatigue to the utmost



The background at top of page shows the "Perfect" Double-Crimp Weave.

The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.

The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.

Samples on request.

The LUDLOW-SAYLOR WIRE COMPANY SAINT LOUIS

COUNSEL *for* DEFENSE

Meeting orders for NEW equipment

Easton has put more men to work, has greatly increased manufacturing facilities, and has taken other decisive steps to meet today's unprecedented demands. Industrial cars of all types, trailers, electric trucks and other material handling units are rolling out at a pace we once thought impossible.

★

Speed-ups with your OLD equipment

Because we are working against an abnormal backlog, Easton Sales Engineers are free to give their time and counsel toward helping you to get more efficient service with your old equipment. These men can give you new and useful ideas for immediate speed-ups and savings in handling and storage methods. It will pay you to take advantage of their free counsel.

★

Buying and selling USED equipment

Easton has created a "salvage headquarters" for used industrial wheeled haulage equipment. For the duration of the emergency Easton Sales Engineers will be available for counsel and assistance in the purchase or sale of used cars, electric trucks, trailers or other industrial handling equipment. If you have one or more units to sell, send a description with specifications. Engineering Counsel, Easton Car & Construction Company.

W. E. FARRELL, founder, president and first Easton Sales Engineer. Years of experience with the toughest material handling problems, a thorough knowledge of all types of industrial haulage equipment, a practical creative engineering ability . . . those are the assets which the Easton Sales Engineer brings to you in Free Counsel.

EASTON PRODUCTS

INDUSTRIAL CARS
for hand or locomotive haul, or electric

INDUSTRIAL TRAILERS AND SEMI-TRAILERS
for hand, tractor or motor-truck haul

ELECTRIC TRUCKS
load-carriers, low-lifts and tier-lifts

DUMP BODIES
for cars, trucks and trailers

ACCESSORY EQUIPMENT
turntables, track, skids, hoists

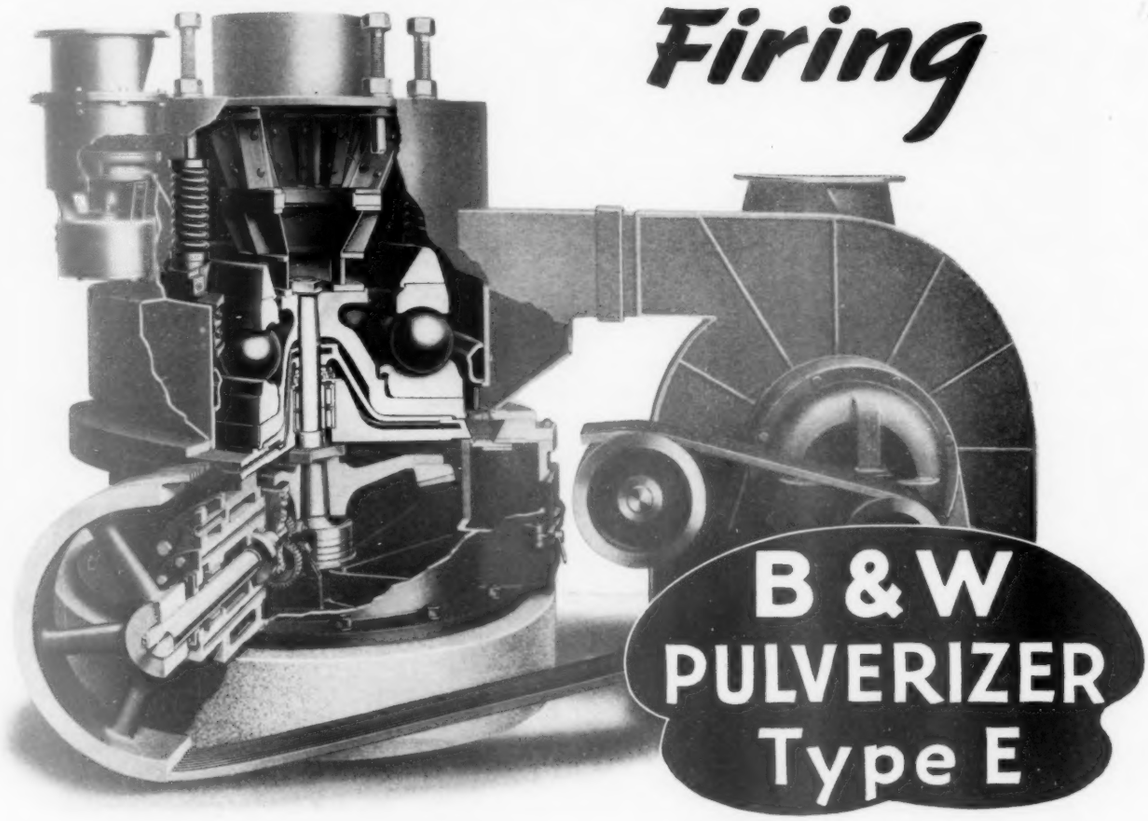
Over twenty-five years service to industry in the design and construction of cars, trucks and trailers for every industrial purpose. Capacities ranging from 2 to 250 tons.

EASTON

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

PIT AND QUARRY, September, 1941, Vol. 34, No. 3. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago, Ill. Subscription price $1 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 20 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.

The LEADING PULVERIZER for Direct Firing



Successful direct firing of rotary cement kilns was developed by Babcock & Wilcox in 1932. Today, 97 cement kilns are direct-fired with B&W pulverizers. This is 44 per cent of all the direct-fired cement kilns now in service.

The modern pulverizer for economical direct firing is the B&W Pulverizer, Type E, illustrated on this page. The Type E mill employs the ball-bearing principle of grinding—used successfully in more than 700 installations.

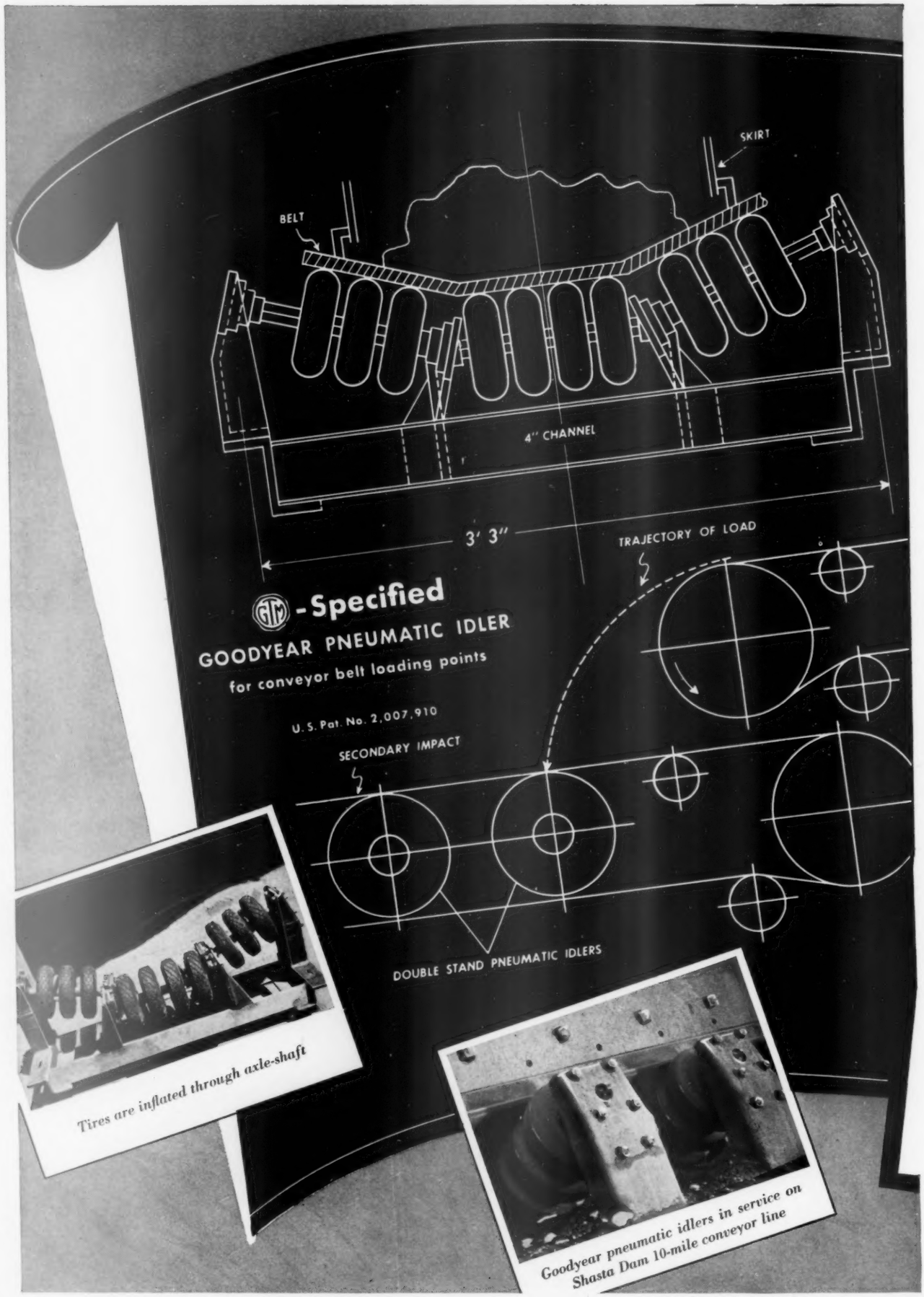
THE BABCOCK & WILCOX COMPANY

85 Liberty Street **New York, N. Y.**

C-42

BABCOCK & WILCOX

A 15 TIME FAVORITE for Rock Service
PENNSYLVANIA GLASS SAND CORP. INSTALLS LORAIN NO. 15
• Here's a case where numbers, rather than words, best describe the qualifications of Lorains for rock service. This new 1¼-yd. shovel is the 15th Lorain purchased by the Pennsylvania Glass Sand Corp., Lewistown, Pa. for quarry duty. It's on the job because each of 14 other Lorains did an outstanding job in rock —and that's really a record to shoot at.
Lorain rock shovels range in capacity from 1 to 2 yds. Turntables are built to Center Drive design for direct-to-the-point power transmission, increased capacities and a stronger, more simplified construction. Every unit is mounted on a rugged, 2-speed Center "Chain" Drive crawler, and is equipped with heavy-duty, all-welded steel shovel boom. Catalogs describing these rock-proved machines will be sent on request.
THE THEW SHOVEL COMPANY
LORAIN, OHIO
THEW CENTER DRIVE
REG. U.S. PAT. OFF
3/8 to 2 YD. LORAINS


SKIRT
BELT
4" CHANNEL
3' 3"
TRAJECTORY OF LOAD
GTM-Specified
GOODYEAR PNEUMATIC IDLER
for conveyor belt loading points
U. S. Pat. No. 2,007,910
SECONDARY IMPACT
DOUBLE STAND PNEUMATIC IDLERS
Tires are inflated through axle-shaft
Goodyear pneumatic idlers in service on Shasta Dam 10-mile conveyor line

Another Great New Advance
IN CONVEYOR BELT PERFORMANCE

Now—PNEUMATIC CUSHIONING at loading points TRIPLES *belt-life in heavy-duty service*

TODAY Goodyear takes pride in announcing the greatest contribution to conveyor belt engineering since its conquest of mildew — a new method of air-cushioning heavy impacts at the loading point which protects belts from damage and greatly prolongs their service life.

It started at Grand Coulee Dam several years ago. There, huge 60"-wide run-of-pit conveyor belts were being cut, gouged and smashed to pieces by the constant impact of boulders running up to three feet in diameter and *more than a ton in weight.* Under these brutal conditions heaviest construction belts were failing in six to seven million tons' service.

The first remedy considered was rubber-covered idlers. But these did not "give" enough — did not have sufficient energy-absorbing capacity. Cushioning the idler supports offered only little better protection — the belt would still absorb most of the impact before the cushioning came into play.

At this point, careful engineering analysis suggested a startling solution to the G.T.M. — Goodyear Technical Man. It was — *pneumatic tires!* Application of the laws of energy indicated that tires alone had both the capacity and the life to absorb these impacts.

At the G.T.M.'s direction a stand of pneumatic industrial tires, mounted on a free-rotating shaft, was placed beneath the belt, directly under the trajectory of the load. A second stand of tires was set two feet distant along the line of belt-travel to absorb secondary impacts.

With this air-cushioned protection, a new set of belts handled 21,000,000 tons of rock — *three times greater tonnage than previous belts* — and the belts were still in good condition when recently removed on completion of the job.

Not only does this new, cushioned loading safeguard belts from smashing abuse, but it prevents cuts and gouges in the cover, and keeps abrasive material from being trapped between the skirt boards and the belt.

Today, on Goodyear's great 10-mile conveyor belt system at Shasta Dam no less than 520 tires are being used for cushioning — two banks of ten tires at each of the 26 transfer loading points—to insure maximum belt life.

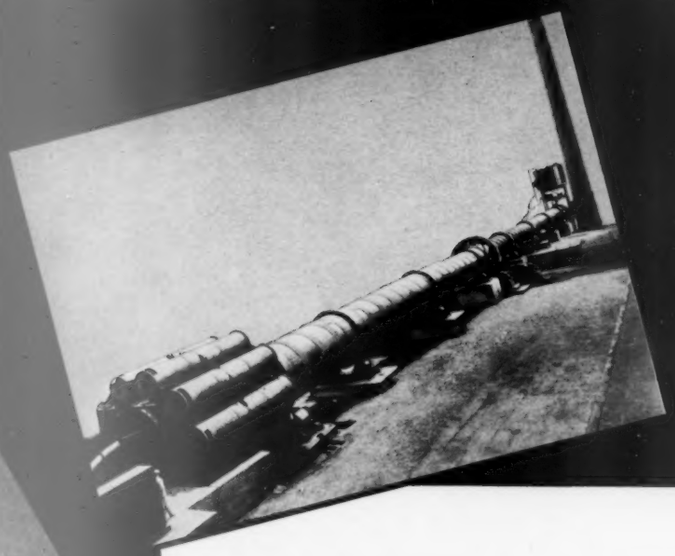
The proper application of pneumatic cushioning is dependent upon a number of factors. Goodyear has now resolved complete data on the quantitative ability of belts to absorb impact-energy in terms of inch-pounds per inch of belt width, per inch of belt thickness — and from this has designed tire assemblies to meet all conditions likely to be encountered.

If your belts are failing from abuse at the loading point, it will pay you to consult the G. T. M. on this new Goodyear development, as well as other exclusive advantages that make Goodyear conveyor belts the world's first choice. To bring him to your office, write Goodyear, Akron, Ohio or Los Angeles, California—or phone the nearest Goodyear Mechanical Rubber Goods Distributor.

THE GREATEST NAME IN RUBBER

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR CONVEYOR BELTS THAN ON ANY OTHER KIND

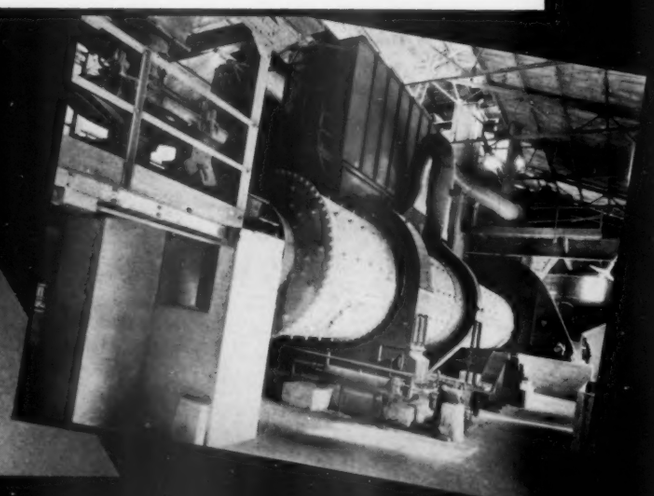


ROTARY KILNS

Machinery for Cement-Lime-Ore

In addition to a complete line of Rotary Kilns and Grinding Mills, F L. Smidth & Co also manufacture Coolers, Pre-Coolers, Pre-Heaters, Recuperators, Air Separators, Agitators, Packers, Extractors, Feeders, Burners, etc. and their auxiliary equipment, for the manufacture of Cement, Lime, Ores, and Allied Products

GRINDING MILLS



F. L. SMIDTH & CO.

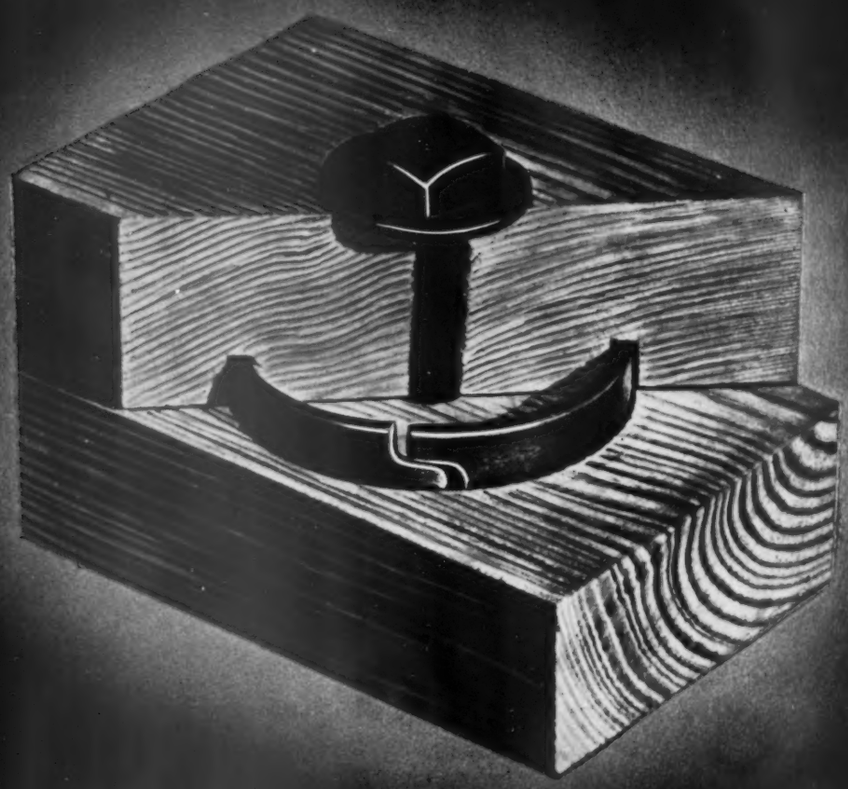
60 EAST 42ND STREET

CEMENT ENGINEERING
CEMENT MACHINERY

NEW YORK, N. Y.

This timber joint

DOES MORE--COSTS LESS



The TECO TIMBER CONNECTOR brings into play the full stamina of each framing member by spreading the load on a joint over the entire cross-section of the wood. This simple device changes timber from a carpentry to an engineering material . . . vastly increasing timber's structural uses by making the economy of timber construction applicable where timber has not heretofore been considered.

TIMBER ENGINEERING COMPANY, INC.
1337 Connecticut Avenue • Washington, D. C.

PIONEER CONVEYORS

BELT CONVEYOR FOR EVERY JOB

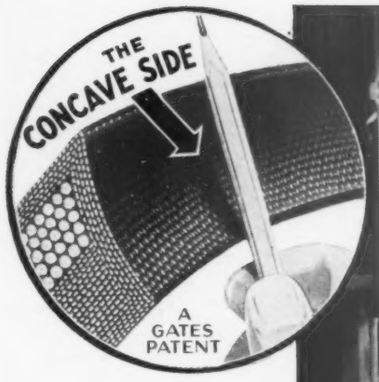
— big ones — little ones — complete conveyors with sectional lattice frame — portable conveyors — or conveyor units and mechanical parts. Terminal equipment — idlers — belts — feeders — supports — belt tighteners — and accessories.

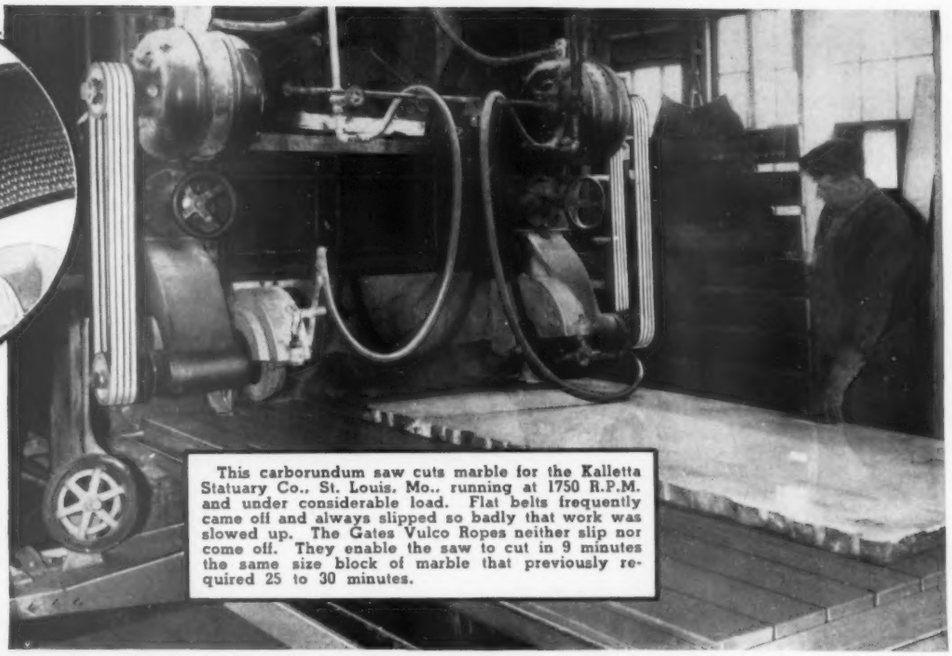
If it's conveying equipment — Pioneer has it.

Ask for complete detailed information on Pioneer conveyors and units.

PIONEER ENGINEERING WORKS

1515 CENTRAL AVENUE · MINNEAPOLIS, MINN.





This carborundum saw cuts marble for the Kalletta Statuary Co., St. Louis, Mo., running at 1750 R.P.M. and under considerable load. Flat belts frequently came off and always slipped so badly that work was slowed up. The Gates Vulco Ropes neither slip nor come off. They enable the saw to cut in 9 minutes the same size block of marble that previously required 25 to 30 minutes.

This Simple Test → Shows Exactly Why

The Patented

CONCAVE SIDE

substantially cuts your belt costs!

What Happens When a V-Belt Bends

FIG. 1

FIG. 2

To see *for yourself* the money-saving importance of the Concave Side, simply pick up *any* V-belt you have handy and bend the belt as it bends in going around a pulley.

As the belt bends, grip its side-walls between your finger and thumb. You will feel the sides of the belt *change shape*. If the sides were straight before bending, they become *convex* as the belt bends. (See Figure 1 on the left). Note how the sides bulge *out*.

Now look at Figure 2. Here you see how bending changes the shape of a belt with the patented concave side. The side becomes perfectly straight. This belt, when bent, precisely fits the sheave groove. Two big savings result —(1) There is no side-bulge and this means uniform side-wall wear—*longer life!* (2) There is a full side-width grip on the pulley and this carries heavier loads without slippage—saving the belts and also saving your *power!*

The concave side is a Gates patent. Only belts built by Gates are built with the concave side.

THE GATES RUBBER COMPANY

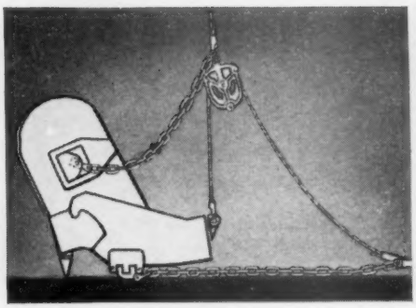
Engineering Offices and Stocks in All Large Industrial Centers

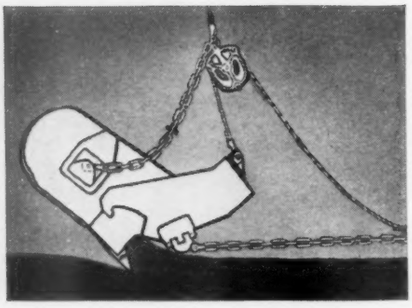
GATES VULCO ROPE DRIVES

CHICAGO, ILL. 1524 South Western Ave.
HOBOKEN, N. J. Terminal Building
BIRMINGHAM, ALA. 1631 1st Ave., South
LOS ANGELES, CAL. 2240 E. Washington Blvd.
DENVER, COLO. 999 South Broadway
DALLAS, TEX. 2213 Griffin Street
PORTLAND, ORE. 333 N. W. 5th Avenue
SAN FRANCISCO, CAL. 2700 16th Street

Here's What We Mean by

AUTOMATIC DIGGING ACTION

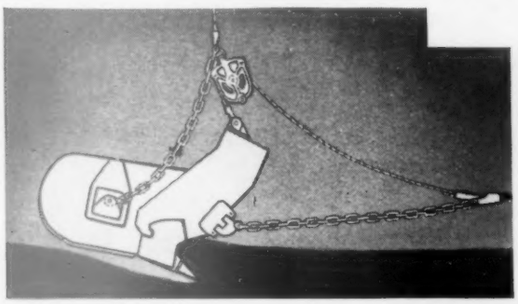




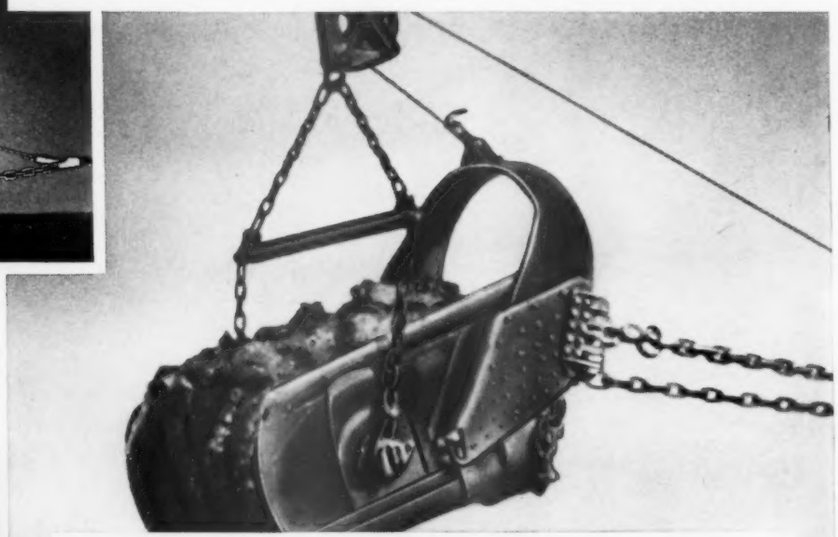
1. PAGE *AUTOMATIC* BUCKETS ALWAYS STRIKE FIRST ON THE FORWARD ARCH. The special patented Page construction is the key to AUTOMATIC Digging Action. Because of it.....

2. PAGE BUCKETS "AUTOMATICALLY" ROTATE BACK ONTO THE TEETH AND ARCH, holding this position *with all lines slack*, eliminating jockeying and jerking. This means that.....

3. PAGE *AUTOMATIC* BUCKETS SOCK RIGHT IN—AT THE FIRST PULL OF THE LOAD LINE. Bearing down with ALL weight on the teeth . . . a Page starts digging NOW! The result is.....



4. PAGE *AUTOMATICS* HANDLE EASIER . . . GET THEIR FULL LOADS QUICKER—AT ANY DEPTH! They get a head start of other, slower types. They dig and carry more "pay loads" per shift than any other make of bucket equal in size and weight!



PAGE
Automatic
DRAGLINE BUCKETS

HERE'S WHAT IT MEANS TO *YOU!*

A Page AUTOMATIC Bucket on YOUR DRAGLINE means MORE DIRT MOVED PER SHIFT! Operators all over the country—on all kinds of jobs tell us that just by switching to Page Buckets they've increased production 20% to 50%. Get in on this "gravy" — these EXTRA PROFITS. Put a Page AUTOMATIC Bucket on YOUR job and start cashing-in NOW. Let us give you full details. See for yourself what it can do for YOU. Fill out the coupon at the left and MAIL IT TODAY!

PAGE ENGINEERING CO . CHICAGO, ILLINOIS

Address this Coupon to:
Dept. A-26. Page Engineering Company,
c/o Clearing Post Office, Chicago, Ill.

Without obligating me in any way, mail a copy of your new descriptive bulletin entitled "Your Dragline WILL Move Dirt Faster."

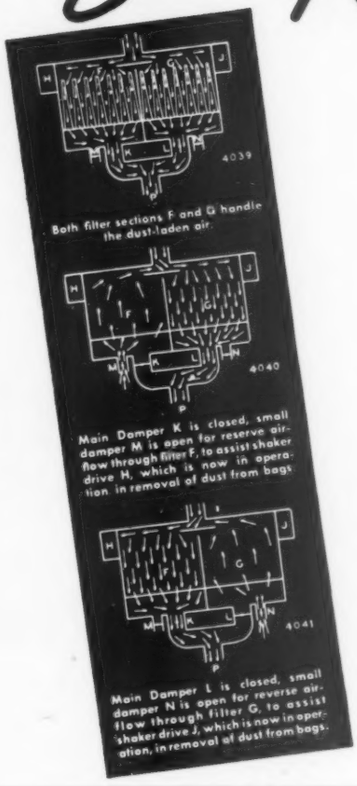
*Name*_____

*Street*_____

*City*_____ *State*_____

● Three Sly Dust Filters Exhausting Packing Machines and Conveyors in a large Cement Plant. This firm has a number of other Sly Dust Filters.

A Better Return ON YOUR INVESTMENT with SLY DUST CONTROL


4039
Both filter sections F and G handle the dust-laden air.
4040
Main Damper K is closed, small damper M is open for reverse air-flow through filter F, to assist shaker drive H, which is now in operation in removal of dust from bags.
4041
Main Damper L is closed, small damper N is open for reverse air-flow through filter G, to assist shaker drive J, which is now in operation, in removal of dust from bags.

● Sly Dust Control Systems offer automatic control, eliminating the human element. This means greater efficiency and longer life—a better return on your investment.

And, if desired, *Continuous* Operation! In some industrial processes dust control must be continuous—*without interruption.* See diagrams at left.

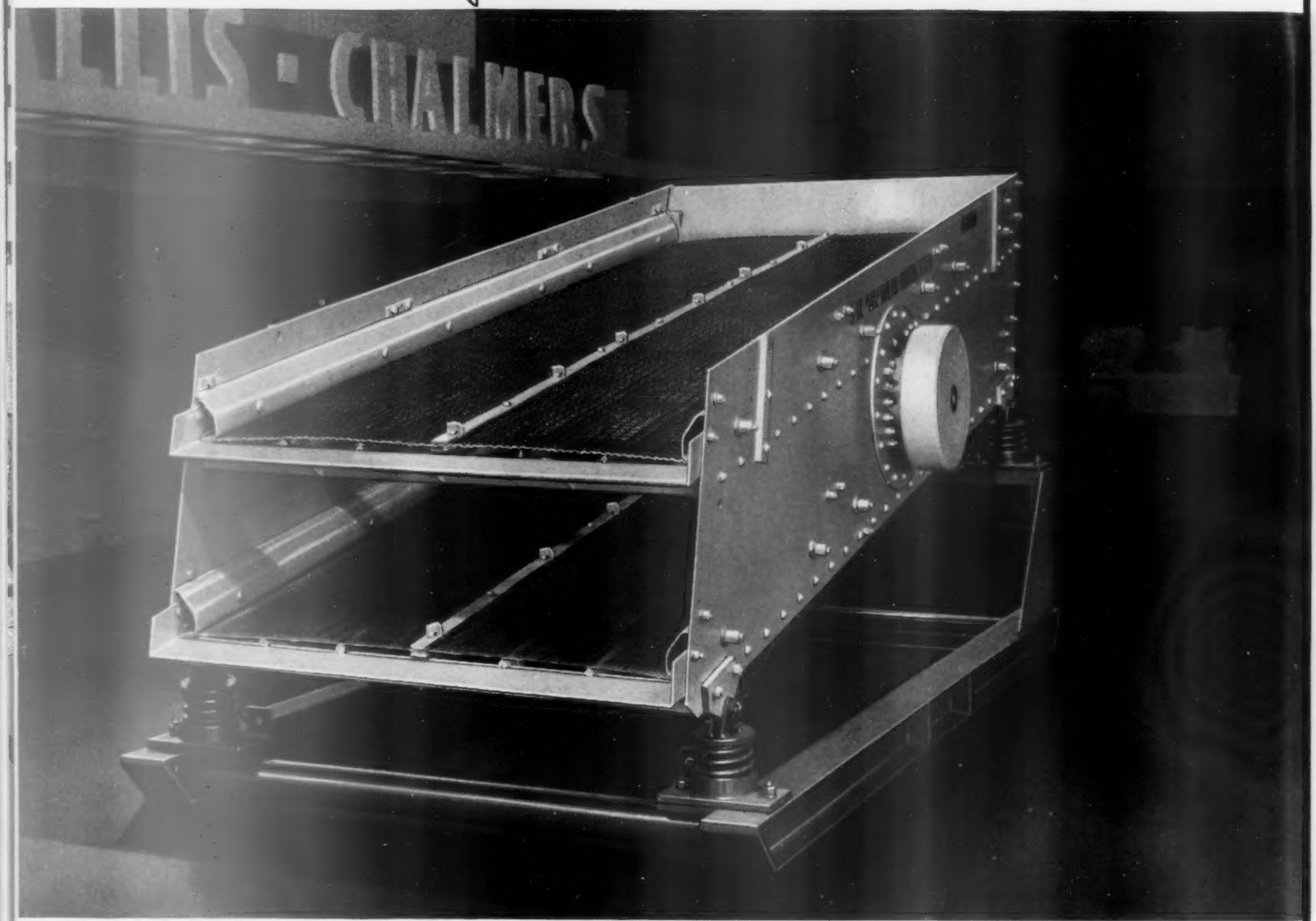
Sly Dust Filters clean the air completely by *filtering* the dust out of it. They have *greater* filtering capacity per cubic foot than any other make, due to the *Special* flat cloth bag pioneered and perfected by Sly. Sly Dust Filters are not expensive. Many plants in the cement and rock products field are definitely profiting from the use of Sly Dust Control.

Ask for Dust Control Bulletin 98 and send details of your problem. There is no obligation, and Sly's experienced engineers will be glad to help you.

THE W. W. SLY MFG. CO.
4745 TRAIN AVE.
CLEVELAND, OHIO

SLY
INDUSTRIAL DUST CONTROL

NO BUCK... NO JUMP



THE ENTHUSIASTIC RECEPTION GIVEN the Allis-Chalmers Ripl-Flo at the Crushed Stone and Sand and Gravel Shows was characteristic of operators' reaction to this remarkable new screen that costs less than any screen with comparable performance on the market today.

ALLIS-CHALMERS A-C MILWAUKEE

Let ALLIS-CHALMERS COOPERATIVE

NO GALLOP!

Uniform Circle Throw of Allis-Chalmers Ripl-Flo Screen Makes Possible Higher Screening Efficiencies. Here Are the Facts on This Remarkable New Screen that Costs You Less than Any Screen with Comparable Performance on the Market Today!

No buck . . . no jump . . . no gallop! Operators no longer have to put up with "galloping" screens in their plants.

For the new Allis-Chalmers Ripl-Flo Screen is *smooth* starting . . . *smooth* running . . . *smooth* stopping! Dynamic balancing has eliminated rough periods . . . there's no damping of vibration even under the heaviest deck loads.

What's more, Ripl-Flo's uniform circle throw imparts equal vibration to each square inch of the cloth. Material doesn't slow down as it travels over the entire deck. You get exactly the right tonnage for a given angle . . . *with maximum screening efficiency!*

Equally important, there is no severe shaking action . . . material is *rolled* over and over . . . degradation is reduced to a minimum . . . no blinding even on material as fine as reclaimed cement!

Because there are no superfluous parts, the Allis-Chalmers Ripl-Flo Screen *actually costs you less* than any screen with comparable performance on the market today! And the low power consumption of this remarkable new screen (as little as 50% of screens of similar capacity) makes your power dollar go farther.

Cooperative Engineering Cuts Your Costs!

The development of the Ripl-Flo is only one of many contributions Allis-Chalmers Cooperative Engineering has made to the cement industry. Our trained engineers can call on a vast reserve of interrelated experience whenever you bring a problem to Allis-Chalmers. Working with your own engineering staff, they analyze your problem . . . help you get the *right* equipment for the job you want done.

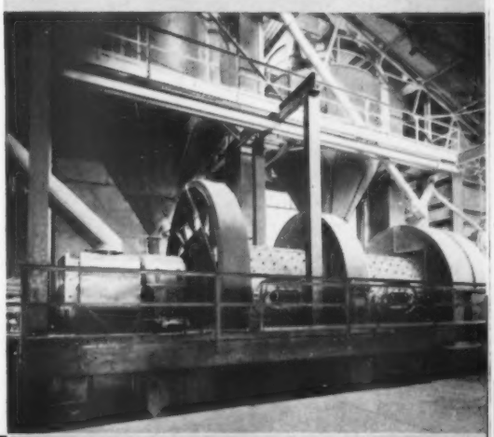
The next time a problem arises in your plant, call in an Allis-Chalmers engineer. Find out how Allis-Chalmers Cooperative Engineering can help you cut your operating costs!

A-1427

News of other Allis-Chalmers Products that cut your costs!

OVER 55,000 FEET OF ALLIS-CHALmers kilns are now giving efficient service in plants all over the world. Shown here is an 8'x140' shell of all-welded construction ready for shipment.

COMBINATION OF ALLIS-CHALmers wet process kiln and Air-Quenching Clinker Cooler—like this South African installation—provides uniform, high-capacity production of clinker.

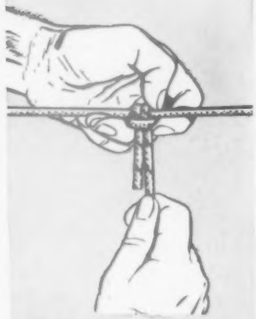


PROGRESSIVE STAGE GRINDING, an Allis-Chalmers development, plays a big part in the industry's present excellence of finished product. Illustrated is a 9½', three-compartment Compeb Mill in a Missouri cement plant.

A-1427

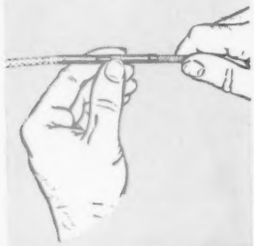
ENGINEERING *Cut your costs*

1. Tie through cartridge.



2. Half hitch branch to main line.

3. Connect main line lengths with *square* knot.



4. Fuse and cap on end of main line.

IMPORTANT

Branch lines should lead away from main lines at *right angles*. Avoid kinks and small loops.

Loading is Simplified

When you detonate with Primacord-Bickford Detonating Fuse, you are saved the labor of preparing separate primer cartridges with fuse and caps or electric blasting caps. For the Primacord detonates every cartridge in each hole, even when separated as in deck loads. Furthermore, you are working with a tough, flexible material, light in weight and strong . . . a detonating fuse that is insensitive to friction, fire, or ordinary shock.

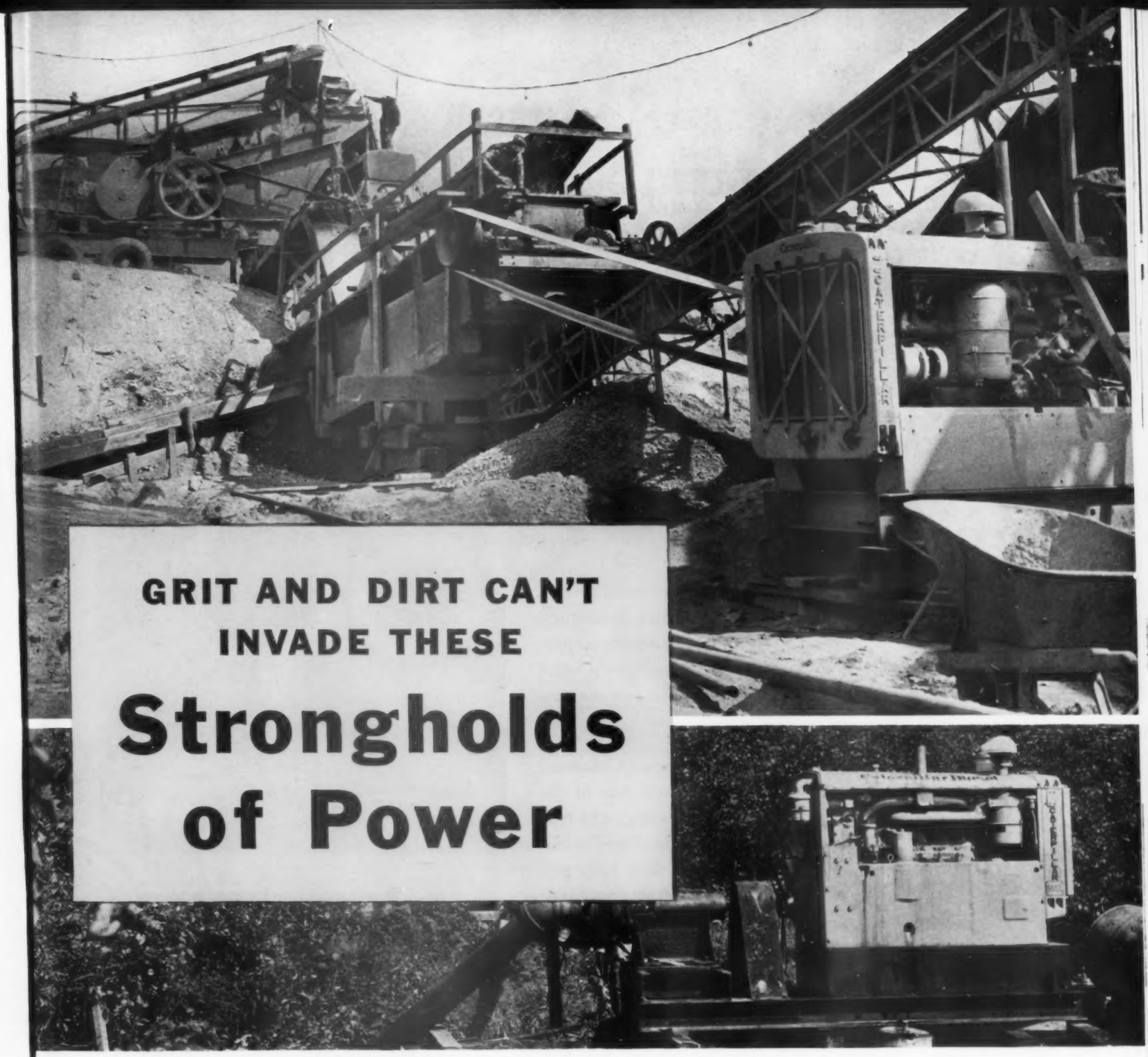
These are some of the reasons why more and more Primacord is being used, even for the relatively small blast.

PRIMACORD BICKFORD
Detonating Fuse

PB-36

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.

Makers of Cordeau-Bickford Detonating Fuse — and Safety Fuse since 1836



GRIT AND DIRT CAN'T INVADE THESE

Strongholds of Power

"CATERPILLAR" Diesel Engines have many outstanding features — for economy, dependability and long life — but none that make them more ideal for crusher work than their devices for protection against the "blitzkrieg" of grit and dirt.

These engines are ***sealed at every point*** at which harmful foreign substances might enter:

- ***Large, three-stage oil-bath air cleaner. Super-efficient absorbent type fuel filter*** (built expressly for "Caterpillar" Diesels).
- ***Combination absorbent and metal-edge type oil filters*** (for double protection). ***Completely enclosed valve-operating mechanism and fly-ball governor.***
- ***Covers, oil pan, housings, etc.,*** are oil and dust tight.

And that isn't all! "Caterpillar" Diesels have these further features:

- ***A fuel system*** that requires absolutely no adjustment whatever; and is so efficient that it burns, ***completely and cleanly,*** even such extra-cheap fuel as No. 3 domestic burner oil.
- ***"Hi-Electro" hardened crankshaft journals and cylinder liners***—having far greater wear-resistance than can be obtained from any other practical method of heat-treatment.
- ***Dual cooling.*** Both oil and water are kept at proper temperatures for most efficient engine performance. Means longer life, lower maintenance for bearings, pistons, rings and liners.

And this is still only part of the story of "Caterpillar" supremacy in the Diesel-power field. Your "Caterpillar" dealer, and the FREE LITERATURE we'll be glad to send you, can tell you a lot more.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

MICHIGAN. Four "Caterpillar" Diesel Engines (two D13000s and two D4400s) power this gravel plant near Marion, Mich., producing 75 cu. yds. of gravel per hour. Engines drive Pioneer crusher, washing plant, log washer and 6-inch centrifugal pump. In operation 14 hours a day. (The pump-driving "Caterpillar" Diesel D4400 in lower view is used with the gravel plant shown in main picture.) These engines are using 7¼c fuel.

CATERPILLAR

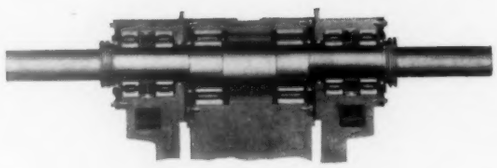
REG. U.S. PAT. OFF.

DIESEL ENGINES AND ELECTRIC SETS

TRACK-TYPE TRACTORS • ROAD MACHINERY

HOW SOUNDER ENGINEERING MAKES UNIVERSAL CRUSHERS *a Better Buy!*

Series "SL"—one of 4 types, 26 sizes of Universal Jaw Crushers.



Dual Bearings Split the Load

Almost any machine shop could build a crusher that would work. But it takes years of experience, field study and—most important of all—sound engineering to produce a crusher that will not only work, but do the most work with fewer replacements and give the longest possible service life—the Universal Crusher.

For example, take the bearing arrangement on Universal Crushers—two large roller bearings on each side of the frame, instead of the customary single bearing, and two roller bearings on the pitman. Splits the load and shock stress four ways instead of two. That's why they put dual tires on trucks—splits up the load—four tires carry the weight instead of only two; easier on the tires, easier on the roads. Same with Universal's bearing arrangement—easier on the bearings—easier on the crusher.

This bearing detail is typical of the sound engineering throughout every Universal Crusher and Crushing Plant—no excess weight, greater capacity, less power consumed, minimized maintenance. Analyze the engineering design—check their performance and you'll pick Universals every time!

Whether it's a stationary or portable plant Universal Crushers give you maximum performance.

UNIVERSAL CRUSHER COMPANY • 619 C Avenue, West • Cedar Rapids, Iowa

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

STRONG AS A GRIZZLY...

handles like a kitten

Bethlehem Purple Strand Form-set Wire Rope combines two of the most important qualities a wire rope can have: strength and easy handling.

Bethlehem Purple Strand is made of 100 per cent Improved Plow Steel, the strongest, toughest steel used in wire rope.

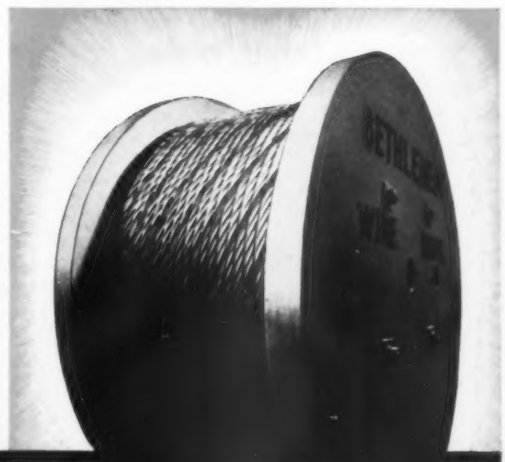
Preforming of this husky high-strength steel produces a rope that is easy to handle as well as rugged. Form-set, Bethlehem's preformed rope, is relaxed, less apt to kink or loop. Cut ends need not be seized. Broken wires won't bristle out of place. And finally, because the rope is preformed, it is better able to stand bending fatigue, thus materially increasing service.

Next time you buy wire rope for a job that requires both strength and ease of handling, get Purple Strand Form-set. It has the stamina for long service, plus the workability that speeds up operations.

PURPLE STRAND

FORM-SET

WIRE ROPE



BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

Superior DIESELS for Low-Cost Operation and Rugged Dependability . . .

Superior Diesels have an unequaled record of universally successful and dependable performance in many installations of this kind throughout the United States and in South America.

8½" x 10½", 6-cylinder, 240 H. P. Superior Diesel moves wet gravel at the Columbus, Ohio, plant of the American Aggregates Corporation. "Smooth, dependable power", says Engineer Robert Knight, "much smoother than the steam engine I used to have."

SUPERIOR DIESELS here demonstrate another phase of their amazing adaptability in providing low-cost power for the highly competitive business of handling stone and manufacturing stone products .... From the comparatively light load of this locomotive, to the tremendous power demand of the largest dredges or rock crushers, there is a sturdy, dependable Superior Diesel to fit every power requirement of the rock products industry.

We will be glad to submit facts and figures on what Superior Diesels are doing for others in the industry and what they may be expected to do for you.

No obligation, of course.

THE NATIONAL SUPPLY COMPANY . . . SUPERIOR ENGINE DIVISION

SALES OFFICES: Springfield, Ohio; Philadelphia, Penna.; New York, N. Y.; Los Angeles, Cal.; Jacksonville, Fla.; Houston, Texas; St. Louis, Mo.; Fort Worth, Texas; Tulsa, Okla.; Boston, Mass. FACTORIES: Springfield, Ohio; Philadelphia, Penna.

How to Save on Manpower and Increase Output

Use LeTourneau Equipment: 'Dozers for Clearing, Roadbuilding, etc.; Rooters for Breaking Tough Materials; Carryall Scrapers for Stripping

LeTourneau Bulldozers and Angledozers save time and manpower, same time cut costs, when clearing new areas for stripping, pioneering and maintaining haul roads, throwing up dams, crowding materials to hoppers and crushers, pusher loading big capacity Carryall Scrapers. They are built to handle punishing work with a minimum of time out for repairs. Ask your dealer to show you how they stand up on nearby tough, rocky jobs.

LeTourneau Rooters enable you to break up almost any material, short of solid rock, for low-cost handling with Carryall Scrapers. On most jobs they eliminate drilling and blasting . . . are faster, safer and far cheaper. They also give you a fragmentation that makes scraper loading much easier, reduces loading time a third to a half, and enables you to use larger Carryalls with the same tractor power.

LeTourneau Carryall Scrapers really go to town on stripping work. They get big loads just as efficiently along 6-inch overburden as they do on a 30-foot bank. With them you can waste overburden permanently out of range of future operations, thus save rehandling. They can be used to build roads, move spoil banks, carry materials to washing plants, crushers, etc. Used today by scores of successful pit owners.

See your LeTourneau-"Caterpillar" dealer NOW . . . ask him how LeTourneau equipment can help you save manpower, cut costs and increase your output.

ONE-MAN OPERATION

All tractor-drawn LeTourneau equipment is operated from the tractor seat by means of cables from a Power Control Unit similar to the one shown here. Carryall Scraper, Rooter and Dozer are interchangeable on the same tractor and Power Control Unit—change from one rig to another is easily and quickly made. One man operates both tractor and equipment. More than 18,000 fast-acting LeTourneau Power Control Units—more than all other makes combined—are now in use increasing the efficiency of tractors and manpower. They can do the same for you.

LeTourneau Bulldozer and "Caterpillar" D7 tractor eliminating hand cutting in the clearing of a new area in Georgia.

LeTourneau Rooter and "Caterpillar" D7 ripping sandstone for Carryall Scraper loading in a pit near Fayette, Missouri.

Stripping overburden with two LeTourneau W Carryall Scrapers (23 yards heaped capacity) and "Caterpillar" D8 tractors near Mount Carmel, Penn. This successful operator uses a 'Dozer for pusher loading, thus gets bigger loads in less time.

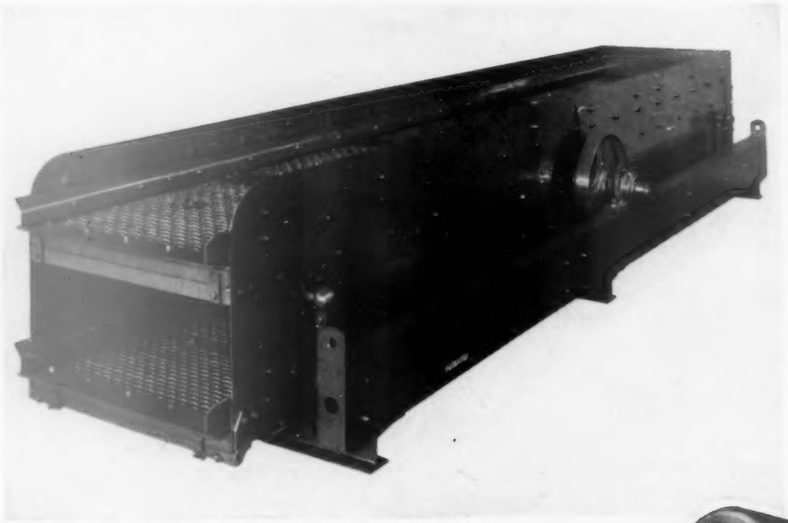
LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

CABLE ADDRESS "BOBLETORNO"

CARRYALL* SCRAPERS, ANGLEDOZERS*, BULLDOZERS, ROOTERS*, POWER CONTROL UNITS, TRACTOR CRANES, PUSHDOZERS, SHEEP'S FOOT ROLLERS, TOURNAPULLS*, TOURNATRAILERS*, TOURNACRANE. *Name Reg. U. S. Pat. Off.

SECO *Screens Keep Busy on* SKF



SCREEN EQUIPMENT CO., INC., built this Screen, the outstanding characteristic of which is "absolute balance, and then full control of that balance through a patented equalizer assembly."

The bearings on this Seco Screen are the kind that can take the short punishing jabs of screen service for years . . . and keep coming back for more. They're bearings with a large safety factor and built-in alignment that insures high load carrying capacity regardless of shaft deflections, distortions or weave. They are completely protected by SKF Pillow Blocks against lubricant leakage and entrance of grit and water. If you've been around quarries for any length of time, you've heard them praised time and again for their STANDUPABILITY. That's what really counts in a bearing on a tough job.

4874

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

SKF
ball and roller
BEARINGS

CHECK YOUR REQUIREMENTS!

PLACE YOUR ORDERS **NOW** FOR WINTER DELIVERY

To all Operating Men:

All of us are experiencing more and more the difficulties in securing required materials for satisfactory completion of improved and increased operating facilities. Anticipating requirements well into the future is not only good business, but an absolute necessity.

We suggest you plan now for next season's clinker cooler needs. Placing orders now will give assurance of getting equipment when needed, and in turn assures you of giving your customers just what they want without delay.

Fuller Coolers are giving universal satisfaction, proving every claim made for them; results in fact, exceeding expectations.

Our engineers are at your service. They'll be only too glad to go over your problems with you. But, don't delay . . . act now.

FULLER COMPANY

CATASAUQUA, PENNSYLVANIA

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CO-9

FULLER-KINYON, FLUXO, AND AIRVEYOR CONVEYING SYSTEMS · · · · ROTARY FEEDERS AND DISCHARGE GATES
ROTARY AIR COMPRESSORS AND VACUUM PUMPS · · · · AIR-QUENCHING COOLERS · · · · BIN SIGNALS

In these days . . .

. . . would you try a truck tire with 80% more mileage - - - ?

"Yes, of course I would," you answer. "American industry today demands economy, speed and safety of everyone."

That's right it does, not only of truck tires but wire rope, and—

THERE ARE EQUALLY GOOD REASONS

TO TRY **HAZARD LAY-SET** *Preformed*

More mileage (tonnage, yardage, what have you) is characteristic of Hazard LAY-SET Wire Rope. Why? Because it is preformed at the time of manufacture, and the preforming process endows LAY-SET with extreme fatigue resistance (which means longer life). But the preformed endowment doesn't stop with merely longer service. It makes LAY-SET resist kinking and whipping, handle easier and faster—*and safer*. And those qualities answer your own specifications of economy, speed and safety.

Specify Hazard LAY-SET Preformed for fewer machine shutdowns, steadier production, reduced injuries to workmen. All Hazard ropes identified by the Green Strand are made of Improved Plow Steel.

HAZARD WIRE ROPE DIVISION • WILKES-BARRE, PENNSYLVANIA

Established 1846

AMERICAN CHAIN & CABLE COMPANY, Inc.

District Offices: New York, Chicago, Philadelphia, Pittsburgh, Fort Worth, San Francisco, Denver, Los Angeles, Atlanta, Tacoma

DUST CONTROL IS PROFIT CONTROL

*Buell Equipment Saved One Company** $40,000 IN 13 MONTHS!

DUST IS VALUABLE: Ore smelting, cement production, the processing of certain foods, and many other industrial operations create dusts that are commercially valuable. Their reclamation pays a direct and tangible profit in material saved. In addition, dust control pays indirect profits by *preventing* many losses from dust-caused contamination, reduced efficiency and lowered production rate.

The case cited above is just one example of savings made possible by Buell (van Tongeren) Dust Collectors. The high efficiency of the van Tongeren system of dust collection, offered only in Buell equipment, is evidenced by orders *and re-orders* from an impressive list of America's industrial leaders, firms such as—

LONE STAR CEMENT CO.
FORD MOTOR COMPANY
DOW CHEMICAL COMPANY
NESTLE'S MILK PRODUCTS, INC.
NEW YORK STATE ELECTRIC & GAS CORP.
and many others

Low first cost and negligible operating and maintenance expense are other Buell advantages that will interest you.

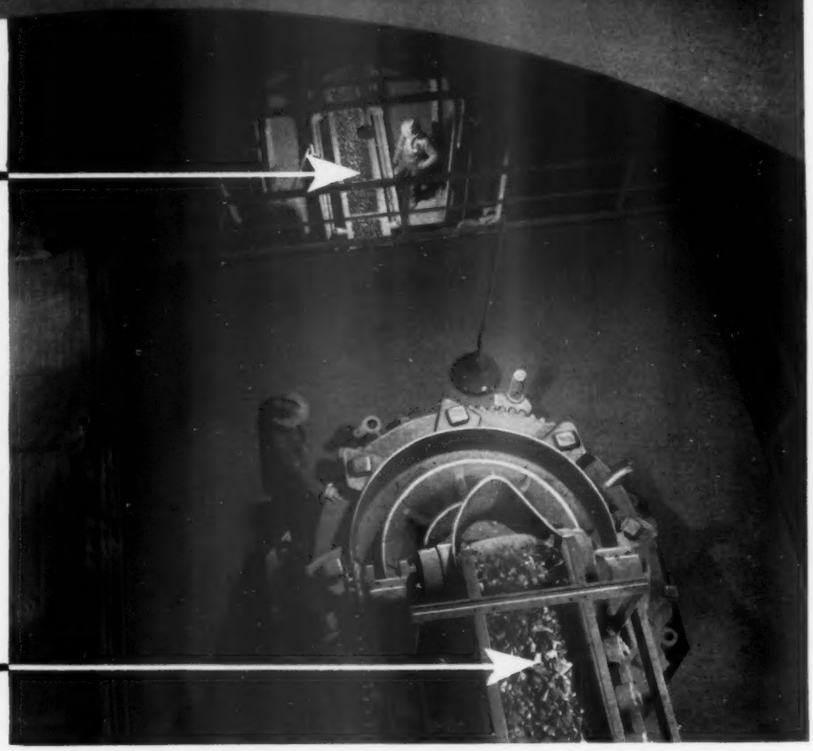
Executives and Engineers will find valuable dust control information in "*Bulletin Q-9, Dust in Industry.*" A copy will be sent on request.

**Name on Request*

BUELL ENGINEERING COMPANY, INC.
Suite 5000, 12 Cedar Street, New York
Nation-wide service through offices of either Buell Engineering Co. or B. F. Sturtevant Co.

buell
DUST COLLECTORS

It Is Still The Most Economical Crusher For Making Minus Half Inch Sizes



Discharge belt below the crusher carrying away the minus ⅜" product.

The minus 3" feed coming to crusher at the rate of 250 tons per hour.

Where there are demands for large tonnages of minus ½ inch sizes, the Symons Short Head Cone is without equal for producing such materials. The performance of this 7 foot machine in making 250 tons per hour of minus ⅜ inch from a minus 3 inch feed is typical of what these crushers are doing on many fine reduction crushing jobs. With a rapidly increased use of finely crushed materials, this modern crusher will make the required sizes at a cost which assures of greater operating profit.

If you are interested in securing greater capacity of fine product at lower cost, investigate the advantages of Symons Short Head Cone Crushers.

NORDBERG MFG. CO., MILWAUKEE WISCONSIN

NEW YORK	LOS ANGELES	LONDON	TORONTO
60 East 42nd Street	Subway Term. Bldg.	Bush House	Concourse Bldg.

SYMONS CONE CRUSHERS

REPUBLIC'S *New Shock-Absorber* CONVEYOR BELT

Puts the Disappearing Act on Impact

Impact... destructive enemy of conveyor belts handling heavy lump material in mines, quarries, construction projects, etc. . . . has long been showing up in the form of punctures in the rubber belt covers and subsequent rupture of the fabric plies. The constant shock and pounding of falling rock, ore and coal at the loading point was often too much for the conventional belt construction to stand. Trouble was, the force of impact was confined to a closely localized area . . . would strike the fairly stiff wear surface and be immediately transmitted through the underlying breaker to the hard belt body.

Republic's newly patented* development, Republic Shock-Absorber Conveyor Belt, overcomes this damaging effect of impact by literally making it disappear out of harm's way. A specially compounded layer of soft, resilient, cushioning rubber is interposed between the cover and the fabric body of the belt. This "cushion" has the necessary properties to spread and dissipate the force of rock and ore striking the belt. The resulting elimination of damage has proved capable of almost unbelievable increases in belt service life. REPUBLIC RUBBER DIVISION OF LEE RUBBER AND TIRE CORPORATION, YOUNGSTOWN, OHIO.

* U. S. Patent No. 2,237,173

ORDER REPUBLIC RUBBER PRODUCTS FROM YOUR DISTRIBUTOR

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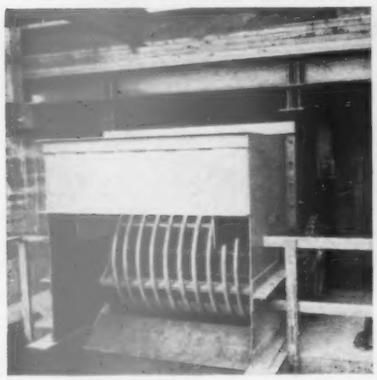
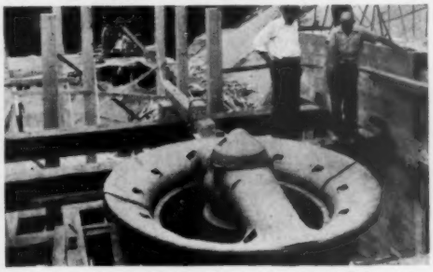
LEADERSHIP IN POLICY PRODUCT AND PERFORMANCE

HOSE · BELTING · PACKING · MOLDED PRODUCTS

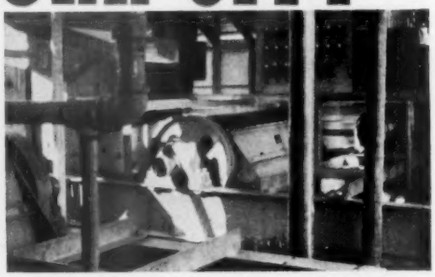
WATER FOR NEW YORK CITY



View of one of plant's two 36" x 6' Telsmith Reciprocating Plate Feeders, and No. 540 Telsmith Rotary Grizzly.

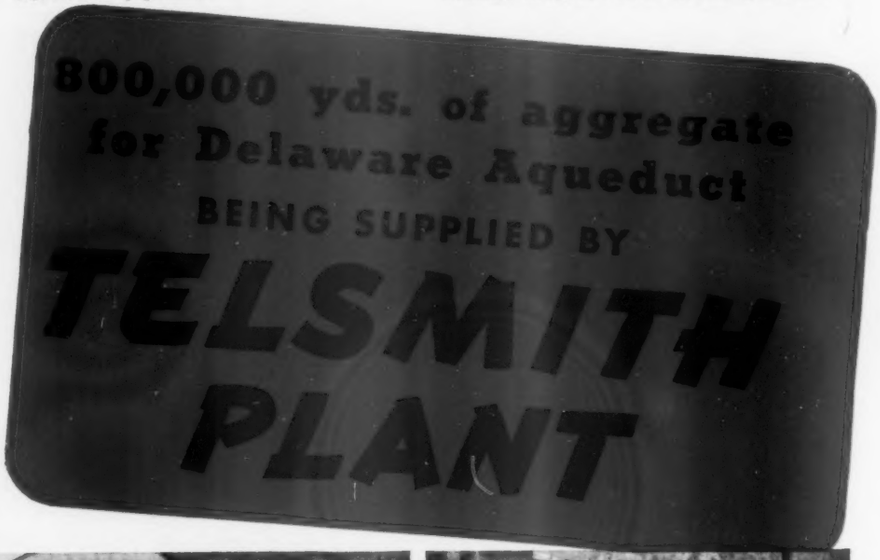


Plus 4" gravel goes to a No. 16-B Telsmith Gyratory Primary Crusher. Minus 4" gravel and sand is by-passed.

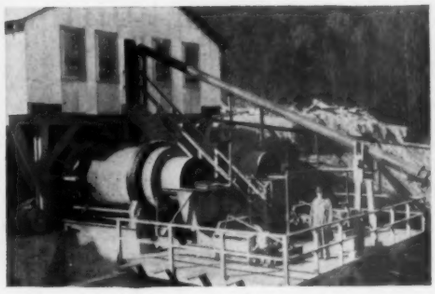


One 5' x 12' Double Deck and two 5' x 12' Telsmith Triple Deck Pulsators act as scalping, preliminary sizing and sand separating screens.

One of the two No. 36 Telsmith Gyrasphere Crushers producing minus 1½" or minus ¾" product as required.



Telsmith Steel Frame Belt Conveyors take finished sand and gravel to steel bins equipped with Telsmith Bin Gates.



Two 72" x 10'6" Telsmith Super-Scrubbers thoroughly clean the gravel, and eliminate any clay or soft stone.

Two 3' x 8' Telsmith Double Deck Screens rinse and size the gravel. The lower 1¼" deck dewaters the gravel.

Processing 800,000 cu. yds. of concrete aggregates for the big Delaware Aqueduct. And meeting the tough specifications of the New York City Board of Water Supply—1½" and ¾" gravel, and minus ¼" sand with no crusher grits. A big job! And it takes a big tonnage plant! The Rossoff Sand & Gravel Corp. has just such a plant near Kerhonkson, N. Y.

In co-operation with Mr. Samuel R. Rossoff and his engineers, this new and completely modern plant was designed by Telsmith. Telsmith built the machinery . . . supervised its installation . . . co-ordinating and balancing every unit. And the plant is turning out its required tonnage every hour. Telsmith sound engineering experience, Telsmith high grade equipment, and Telsmith centralized responsibility, here as in so many other plants, delivered all-around satisfactory results.

Are you about to build a new gravel pit, or quarry plant? Or planning to expand your present plant? Then it most certainly will pay you to find out about Telsmith complete plant service and equipment.

Get Bulletin G-15. Sent free, on request. G-8

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

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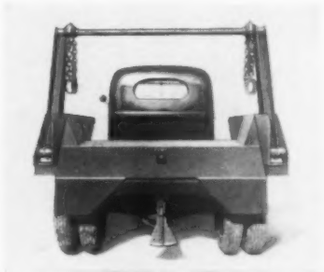
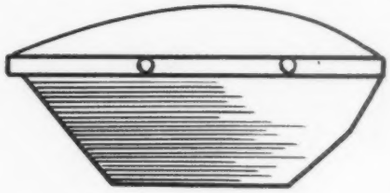
Charleston Tractor & Eqpt. Corp. Charleston, W. Va.
Roanoke Trac. & Eqpt. Co. Roanoke, Va.
North Carolina Eqpt. Co. Raleigh and Stateville, N. C.
Wilson-Weesner-Wilkinson Co. Knoxville and Nashville, Tenn.
G. F. Seeley & Co. Toronto, Ont.

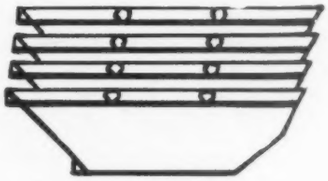
Relieves truck strain by supporting overhang and eliminates counterweights.



Clear platform space for general hauling when bucket is not in use.



Extra capacity of heaped load due to flared sides of bucket.



Buckets can be nested for convenience when carrying empties.

Ask for 16 Page Catalog No. 41.

Brooks LOAD LUGGER

Trade Mark Registered

is winning the fight against "Cost Inflation"

CORRECT LOAD DISTRIBUTION with center line of load well forward of rear axle.

Are rising costs and competition putting the "squeeze play" on your profits?

Then just mount a LOAD LUGGER on the chassis, and at once your truck becomes a high efficiency hauling unit, operating a multiple dump-bucket system, which shows 25% to 50% savings over ordinary methods of handling materials.

It puts an end to time loss and idle equipment . . . because the work is continuous . . . while the LOAD LUGGER is hauling and dumping, the men are filling empties. No waiting, no delays, and the work is easier for the men, loading into low-side flare-edge buckets.

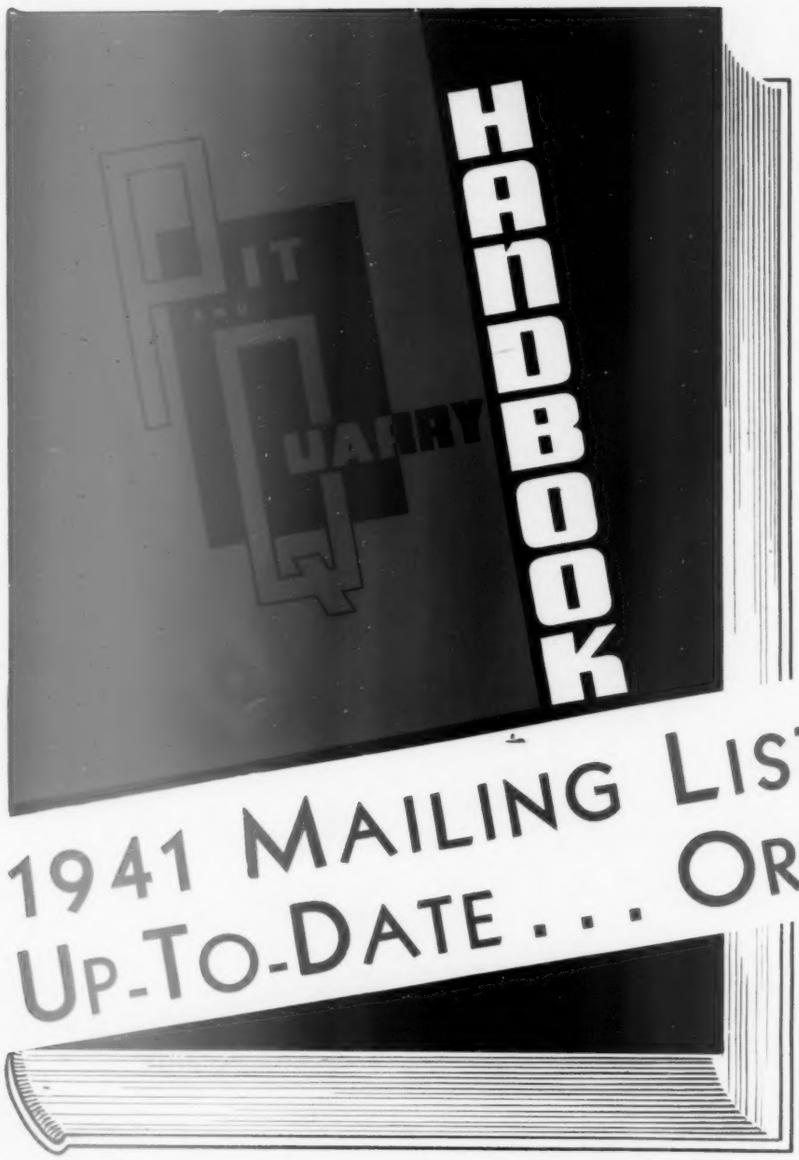
Wherever LOADING IS DONE BY HAND

there is a place for the LOAD LUGGER to help you beat the "cost game." Road building . . . quarrying and maintaining constant feed to the crusher . . . stripping overburden . . . open-pit mining . . . industrial hauling and government projects . . . these are jobs where the LOAD LUGGER is "tops in economies."

Ask about Our Special Introductory Offer

Brooks EQUIPMENT AND MFG. CO.

109 Davenport Road — *Distributors in all Principal Cities* — Knoxville, Tennessee



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The compilers of the 1941 Directory Section of Pit and Quarry Handbook have labored painstakingly to build an accurate list of all known American producers of nonmetallic minerals. Each new listing has been carefully scrutinized for accuracy and completeness. Previous listings have been revised, checked, double-checked. All appear two ways—(1) alphabetical by companies, (2) geographical by plants. It gives you company names, officers, location of plants, size or capacity, and names of the men who do the buying. Select the complete Handbook and Directory, or the convenient, flexibly-bound Directory alone. Now ready for distribution. Order NOW to insure getting one of the first copies. Use coupon below . . . we'll bill you after you get the book.

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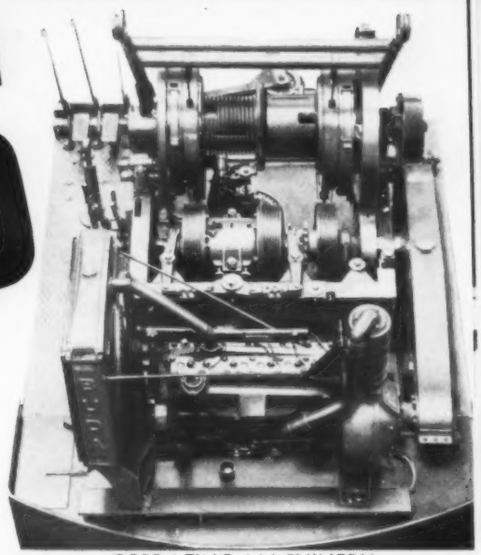
FEATURES

THAT DEFEND YOUR SPECIAL INTERESTS

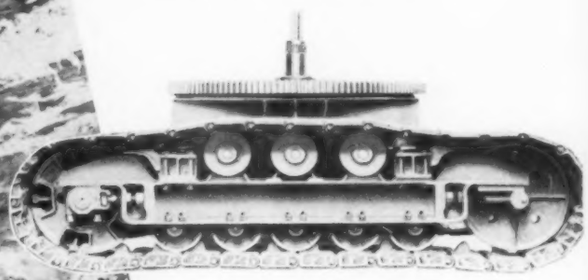
What makes a shovel "tick" is of vital concern to every quarry operator. It provides him with a basis for determining the merits of rock digging equipment before he buys. Study the MARION features described here in that light. They back MARION'S DEPENDABLE PERFORMANCE every yard of the way—giving sound reasons for modernizing with MARIONS.

THE MARION STEAM SHOVEL COMPANY
MARION, OHIO, U. S. A.



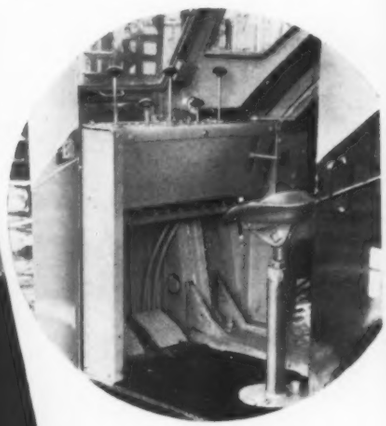
OPERATING MACHINERY

Compact . . . accessible . . . for ease of maintenance and operating simplicity.



LOWER FRAME

Maximum strength with light weight, self-cleaning, non-clogging, non-binding crawlers.



AIR CONTROL

of all operating movements introduces finger-tip control and a new conception of accuracy over all previous methods, and with a minimum of linkage and levers.

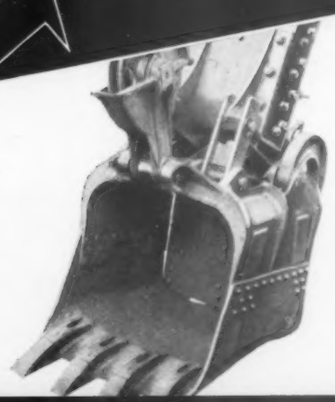
SHOVEL BOOM

Welded, all-steel box or tubular construction built deep and wide to withstand the stresses incident to heavy digging.

MARION

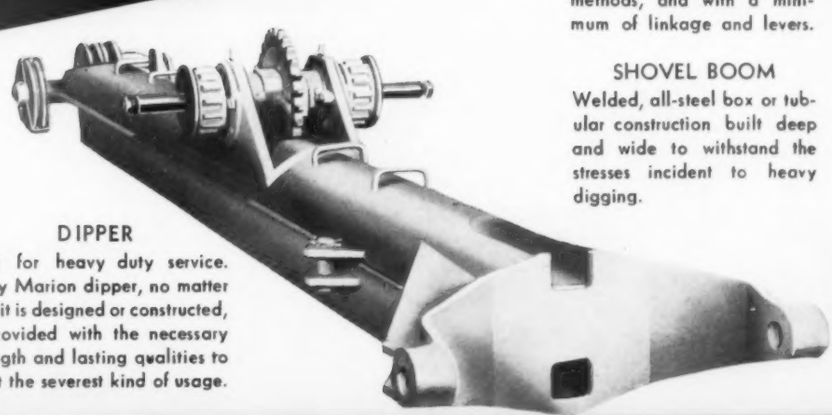
CRANES • DRAGLINES • SHOVELS • PULL-SHOVELS • CLAMSHELLS • WALKERS
From 3/4 cu. yd. to 35 cu. yds. • Gasoline • Diesel • Electric

Modernize with



DIPPER

Built for heavy duty service. Every Marion dipper, no matter how it is designed or constructed, is provided with the necessary strength and lasting qualities to meet the severest kind of usage.



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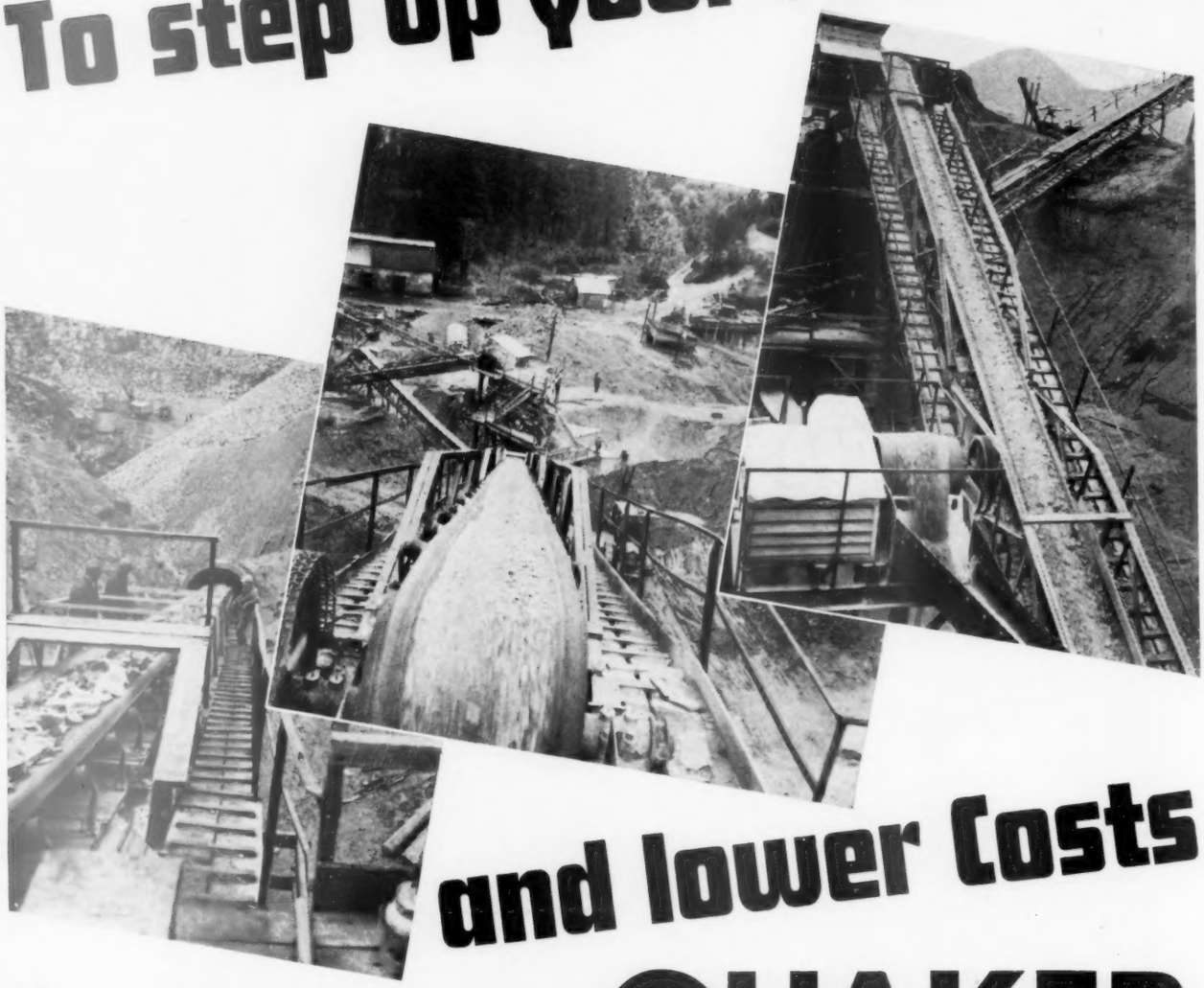

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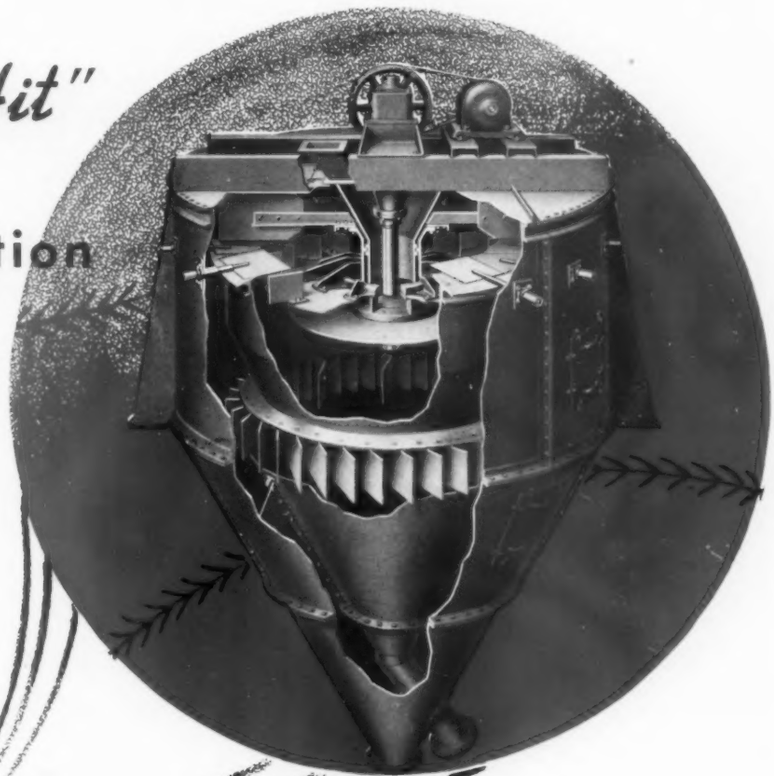

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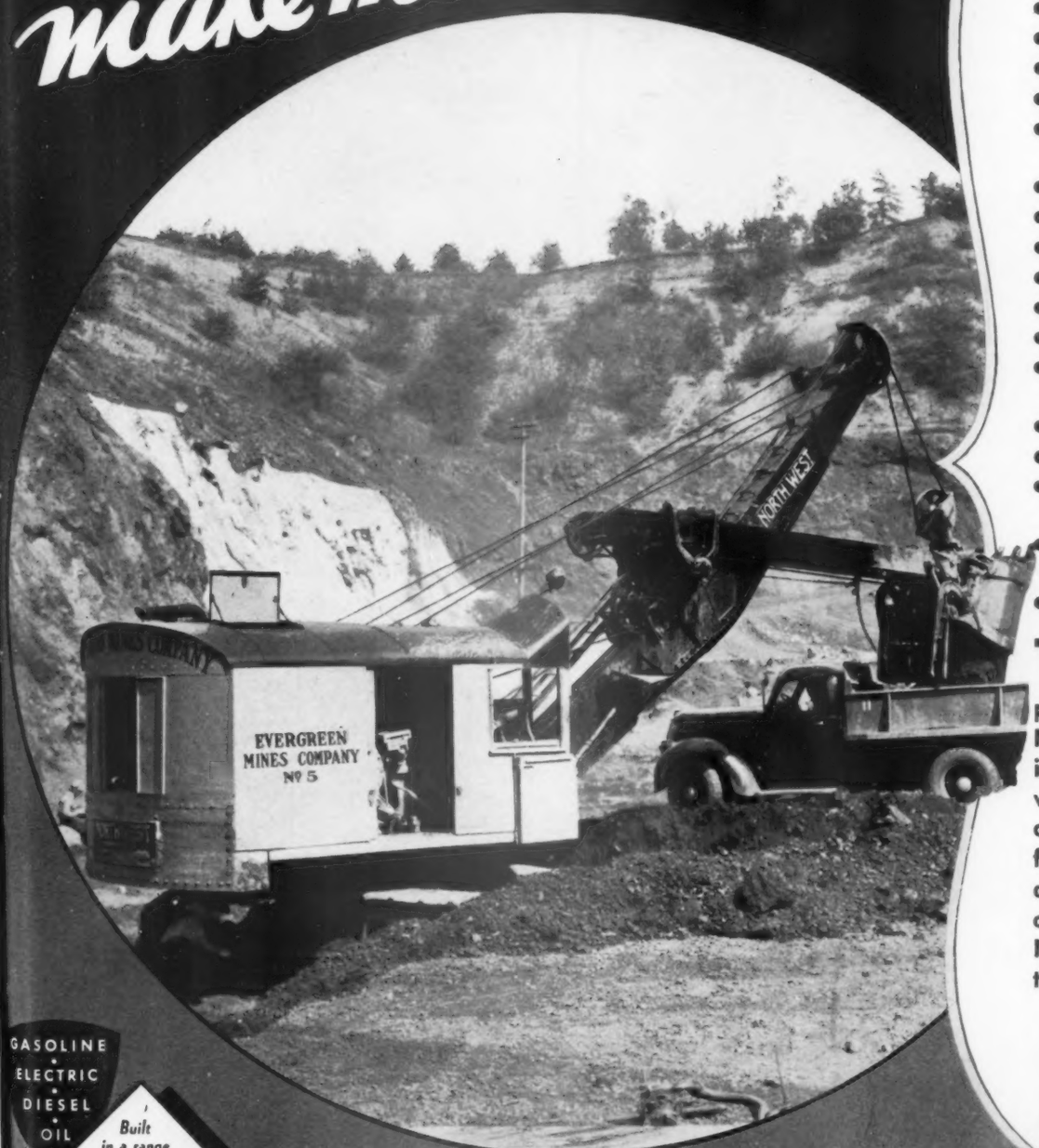

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Built in a range of 18 SIZES 3/8 yd. capacity and Larger

HERE'S WHAT YOUR MONEY BUYS IN A NORTHWEST

- *Simplicity of Design*
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- *Dipper Sticks tied together at inner end*
- *Welded Boom and Dipper Sticks*
- *Demountable Lagging*

THESE features can represent the difference between profit and loss to you. These Northwest advantages mean increased speed and output, with lower maintenance costs. Many of them are found on no other machines, and together they offer a combination that makes Northwest the best buy on the market today.

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The standard mill for such materials as:

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Record high tonnages per horse-power are obtained with the latest type of Raymond Low Side Roller Mill.

The extra large area of the grinding elements . . . the oil journals with automatic circulation . . . high grade, oversize bearings . . . as well as the sturdy and finely balanced construction, growing out of more than 50 years manufacturing experience . . . all these contribute to the unusually low cost of production.

Optional features of this mill are: (a) Spider vanes mounted on top of main shaft in separator for giving closer control of classification, and (b) Air-drying system for removing surface moisture from materials while pulverizing.

SINCE 1887

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Combustion Engineering Company, Inc.
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DEC 19 1941

PIT AND QUARRY

Vol. 34 SEPTEMBER, 1941 No. 3

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H. W. BAUMGARTNER
President

STANLEY A. PHILLIPS
Vice-President and Directing Editor

Field Editor:
W. E. TRAUFFER

Associate Editor
HARRY F. UTLEY

Circulation Manager:
W. T. KLUSSMAN

Advertising Manager:
JAMES E. MONTGOMERY
Telephone HARrison 9357
Chicago, Ill.

Eastern Advertising Manager:
W. A. WILSON
Room 430, 122 East 42nd St.
Telephone CALedonia 5-4438
New York, N. Y.

Central Advertising Manager:
D. R. EGBERT
Auditorium Bldg.
Telephone CHerry 4432
Cleveland, O.

Advertising Representatives:
A. C. PETERSEN
Chicago, Ill.

W. H. GRUBBS
Western Pacific Bldg.
Telephone Prospect 3746
Los Angeles, Cal.

ROBERT W. WALKER
68 Post Street
Telephone Sutter 6706
San Francisco, Cal.

Field Representatives:
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1892 ADVERTISEMENT IN THE
ENGINEERING AND MINING JOURNAL

ROBINS CONVEYING BELTS.
THOMAS ROBINS, Jr., 120 Liberty St., New York, N. Y.

Rolling Along
Since '91

Ever since the above advertisement was inserted, the unfolding story of the ROBINS CONVEYING BELT COMPANY has been appearing in the records of Industry.

Back in the 'Nineties' Thomas Robins began his first experiment with 'conveying belts' carrying bulk materials. Whether he knew it then or not, another milestone in America's industrial progress had been reached, and another substantial business was launched.

It has been a long time since an advertisement like this 'old timer' told the whole story of Robins. The success of the Belt Conveyor led to the introduction by Robins of Troughing Idlers with ball and roller bearings; the first Automatic Tripper and the first Portable Conveyor. Robins Travelling Bridges and Unloading Towers are found all over the world; and from this same company came the first mechanical system of ore bedding and reclaiming. Robins also made the original mechanical Vibrating Screen for sizing materials. GYREX, VIBREX and ELIPTEX are trade names familiar to plant operators wherever Vibrating Screens are used.

Industries basic bulk materials are rolling along on Robins Material Handling Machinery

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TRIPPERS
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BIN GATES
COAL CRUSHERS
COKE CRUSHERS
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CAR DUMPERS
COAL BRIDGES
ORE BRIDGES
LOADING TOWERS
UNLOADING TOWERS
SELF-UNLOADING BOATS

ROBINS CONVEYING BELT COMPANY
• PASSAIC, NEW JERSEY AND PRINCIPAL CITIES •

PIT AND QUARRY

CHICAGO SEPTEMBER, 1941

Independent Union Is Branded as "Illegal" by Leaders of C.I.O.

Leaders of the C.I.O. United Mine Workers are still determined to fight United States Gypsum Company officials to a finish despite the fact that the company has just signed a contract with the Independent Mine Workers Association.

In a mass meeting at Oakfield, New York C.I.O. leaders sought to bolster the morale of strikers. They declared that the Oakfield plant, with the 17 other branches of the company, must eventually come under C.I.O. domination. They branded the new independent union as illegal and said steps have been taken against the company before the National Labor Relations Board, charging unfair labor practices.

Non-strikers declare, however, the strike is broken. The sentiment of Oakfield residents is with the workers who, they say, are capable of straightening out their own labor problems. Harold Schultz, president of the independent association, said the plant is being operated by 350 workers. Union pickets still patrol plant entrances, however.

Complete Electrification at Silica-Sand Plant

Electrification of the plant of the Everton Silica Sand Company at Everton, Arkansas, is being completed. Power is being supplied by the Arkansas Power & Light Company.

Mineral-Wool Specialist Builds Australia Plant

Charles D. Richardson, for many years general manager of the General Insulating & Manufacturing Company and its successor, the National Gypsum Company, left recently by Clipper plane for Australia where he has been commissioned to design and erect a huge mineral-wool plant for the James Bell Mineral Products Company, Ltd., at Melbourne.

Mr. Richardson is one of the pioneers in the American rock-wool industry and holds several basic patents on machines and processes used in its production. He expects to be away about a year.

Ohio Hydrate Operating Buckite Dolomite Plant

Capacity production of approximately 200 tons of refractory dolomite per day is reported at the plant of Buckite Refractories, Inc., at Woodville, Ohio, which was taken over some months ago as a subsidiary by the Ohio Hydrate & Supply Company.

The plant of the parent company, located about a mile away, produces the raw material and delivers it by railroad to the Buckite plant for processing. Two large rotary kilns are employed.

Fred Witmer, president of Ohio Hydrate, also heads the Buckite concern. E. J. Meyer is operating manager.

The Clearwater Gravel Company, of Duluth, Minnesota, has established a new gravel plant in Milaca, Minnesota.

Coming Events

January 28-30, 1942—Cincinnati. Annual conventions, National Sand & Gravel Association, and National Ready Mixed Concrete Association. Netherland Plaza Hotel.

February 2-5, 1942—Cincinnati. Annual convention, National Crushed Stone Association. Netherland Plaza Hotel.

Crushed-Stone Men of New York State to Frolic Near Albany

The New York State Crushed Stone Association is holding its annual midsummer meeting at the Schuyler Meadows Golf and Country Club, near Albany, on September 4.

At noon cocktails and a buffet luncheon will be served on the clubhouse veranda and a program of driving, approaching and putting contests (with prizes in each class for all events) has been arranged. After these contests, a golf match will be played between teams of ten players each representing the New York Highway Department and the crushed-stone industry. There will also be a horseshoe-pitching contest, and a "freeze-out" poker tournament for all who care to enter.

Operations Started at Stone-Products Plant

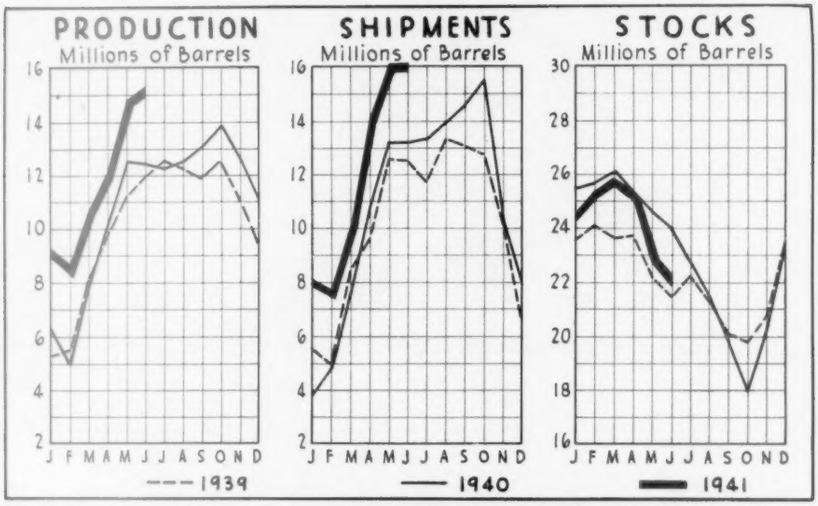
The Peerless Lime Products Company, Rices Landing, Pennsylvania, began operations recently at a new plant. It will produce screenings for road building, for concrete blocks, and for mine blocks; rock dust to be used in coal mines; and agricultural lime. The plant cost $25,000.

J. H. Pekoski, Pittsburgh, is president of the company, and C. I. Rupert, Waynesburg, Pennsylvania, is vice-president and in charge of the plant.

New Plant Will Supply 60,000 Tons of Agstone

An agricultural-limestone plant with a government contract for 60,000 tons of pulverized limestone is being established by the Lime Products Company on Highway 65, eight miles south of Harrison, Arkansas. William S. Brantingham is manager.

The Lime Products Company operates in northwest Arkansas, having plants at Fayetteville, Berryville and Huntsville.



The Portland-cement industry in June, 1941, produced 15,222,000 barrels, shipped 16,109,000 barrels from the mills, and had in stock at the end of the month 21,863,000 barrels of cement, according to the Bureau of Mines. Production and shipments of Portland cement in June, 1941, showed increases of 21.9 and 21.8 per cent., respectively, as compared with June, 1940. Portland-cement stocks at mills were 8.9 per cent. lower than a year ago. The statistics are compiled from reports for June, received by the Bureau of Mines from all manufacturing plants.

National Gypsum's Sales Break Previous Record

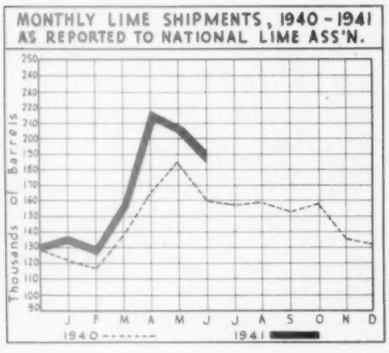
The financial statement of National Gypsum Company for the first six months of this year, reveals that sales reached the highest point in the company's history.

Practically all plants are running at capacity, or are expected to be at capacity within a few months. The company's insulation-board plant at Mobile, Alabama, was reported to be three months oversold.

"Although increased labor rates, additional taxes, and higher costs for such raw materials as we must buy on the outside have contributed heavily to the increased cost of manufacturing," declared M. H. Baker, president of the company, "this situation has been largely offset by greater sales volume and many operating efficiencies. Our program of plant expansion and improvement, now nearly completed, has enabled us to handle a much larger volume of business resulting in production efficiencies that help absorb increased material and labor costs."

For the six months ended on June 30th net earnings of the company amounted to $690,047 after provision for taxes amounting to $709,000. This is equivalent to 41c per share on the common stock. For the corresponding six months of last year net earnings were $607,000 or 37c per share. Tax provisions increased more than a half-million dollars over the same period in 1940.

For the quarter ended on June 30th net earnings, after estimated taxes, were $423,792 or 26c per share on the common stock. Earnings for the first quarter adjusted to the same tax basis amounted to 15c per share.



According to data collected by the National Lime Association, 69 companies in June, 1941, shipped 185,027 tons of lime (112,227 quicklime; 72,800 hydrate). Reporting companies represent 51.4 per cent. of the association's total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry the total shipments for the month are estimated to have been approximately 360,000 tons. Shipments of lime by use and grade for June, 1941, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	749	11,139
Building	20,152	37,713
Chemical	91,326	23,948
Total	112,227	72,800

200-Horsepower Motor Drives Fourth Kiln

The Permanente Corporation recently purchased another General Electric 200-horsepower B.T.A. motor for driving the fourth kiln at its cement plant near Los Altos, California. The three original kilns are similarly powered.

Residential Building at Most Active Stage in 12-Year Period

Residential building in 37 states east of the Rocky Mountains has, during the first six months of 1941, been the most active in 12 years, according to the F. W. Dodge Corporation. The dollar volume of contracts awarded was $948,994,000 in the first half year, and was 37 per cent. greater than the $690,572,000 awarded for residential building during the comparable period of 1940.

In this year's home-building operations the construction of small houses has predominated. Contract awards for one- and two-family houses during the first six months totaled $740,766,000, or 77 per cent. of the residential-building total.

It is also reported by Dodge that of the $740,766,000 spent for one- and two-family houses in the first half, $628,627,000, or 85 per cent., was for private ownership, which indicates that private operations are providing a very large share of the needed new housing facilities.

Contact with Moisture Revealed by New Bag

A cement bag which automatically reveals whether the contents have come in contact with moisture has won a patent (No. 2,250,980) for Thomas E. Workman of Los Angeles, and Harold W. Sayre of San Gabriel, California.

Cement hardens upon coming in contact with moisture. The purchaser can not tell from the outside whether it has absorbed sufficient moisture to destroy its properties. The new bag is designed to give such information on visual inspection.

The bag is colored with an acid dye. Should the cement come in contact with moisture, alkali present in the cement would react with the dye to change its color. The color change would serve as an indicator of moisture contact.

Thus, in one example given in the patent, the bag is dyed with a yellow dye and retains this color as long as it is kept dry. Should the cement, however, come in contact with water or moisture, the dye changes to red.

The patent has been assigned to the California Portland Cement Company, Los Angeles.

A $69,904 contract for paving roads at Fort Custer near Battle Creek, Michigan was recently awarded the Bridgeport Core Sand Company of Saginaw, Michigan.

Two New Plants to Utilize Bauxite in Producing Aluminum

A further increase of 600,000,000 pounds in the country's annual capacity to produce alumina, the material from which aluminum is derived, was recommended to the War Department August 21 by the Office of Production Management. The recommendation would extend the useful reserves of bauxite in Arkansas almost three-fold by bringing into use low-grade bauxite ores which heretofore were never considered of commercial value and never used for the production of aluminum in any substantial quantity.

William S. Knudsen, Director General of the OPM, recommended to Robert P. Patterson, Under Secretary of War, that a plant with capacity to produce 500,000,000 pounds of alumina annually be built in Arkansas and that on other plant previously recommended for construction in the same state should have a capacity of 500,000,000 pounds instead of the 400,000,000 first proposed. The exact site of the additional plant has not been selected but the one recommended previously is to be built near Bauxite in Saline County, Ark. Both plants would be financed by the Defense Plant Corporation and be government-owned.

The OPM recommended that the Aluminum Company of America design, construct and operate both plants, but that, as to the second plant just initiated, the government retain ownership of the alumina and sell it to aluminum-making companies that will not have alumina supplies of their own. Establishment of an agency under the Reconstruction Finance Corporation was proposed to buy ores and set prices for the sale of alumina.

The OPM also recommended to the War Department that the extraction of alumina from alunite be started on a small scale at Marysvale, Utah. This operation would be carried on by Kalunite, Inc., of Salt Lake City, Utah, with a plant having a capacity of 100 tons of ore per day. In addition to treating alunite, the plant would engage in the experimental treatment of aluminous clays, which exist in far greater quantities than any other aluminum-bearing materials in this country. The production of alumina from alunite or clays has never been accomplished on a commercial scale although pilot-plant operations handling about a ton of ore per day have been conducted by Kalunite, Inc., for some time.

Construction of the plants recommended would give the country sufficient capacity to produce a total of 2,720,000,000 pounds of alumina annually. This would be within 300,000,000 to 400,000,000 of the total amount now considered necessary to produce 1,400,000,000 pounds of aluminum metal per year and meet alumina requirements of the abrasives and chemical industries. Alumina is extensively used as an abrasive and also is used in the chemical industry for water treatment, filtration and other purposes. To meet these total requirements, another recommendation will be made in the near future, either for construction of an additional plant or for additions to existing plants.

The plants proposed in Arkansas will use bauxite available in that region and will have special facilities for washing silica out of the low-grade ore. The ore to be used may contain a maximum of 25 per cent. silica but will average considerably less than that. Both the contemplated plants, having a combined capacity of 1,000,000,000 pounds of alumina annually, will operate principally on low-grade bauxite ores.

Calaveras Now Burning Gas in Rotary Kilns

Marking the end of a project started almost two years ago, the Calaveras Cement Company plant near San Andreas, California, is now burning gas in its two kilns instead of fuel oil.

Completion early in August of a $500,000 40-mile pipe-line to the plant is announced by W. W. Mein, president of the company, who states that both kilns have been given a week of tests using gas and that the change-over was made without loss of time.

The pipe-line connects the company's kilns with the main P. G. & E. pipe-line leading into the Sacramento Valley area. It is eight inches in diameter and is capable of delivering to the cement plant approximately 6,000,000 cubic feet of gas daily. The plant is using approximately 4,000,000 cubic feet at the present time.

Test Data on Foundry Sands Made Available

Through the coöperation of a number of laboratories the Foundry Sand Committee of the National Industrial Sand Association was able to arrange for tests of similar samples by the different laboratories to determine how well the results from one laboratory correspond with those from another.

These test data are summarized in a paper entitled *Reproducibility of Tests of Foundry Sand* presented at the annual meeting of the American Foundrymen's Association. The association has a supply of copies of this paper available at 10 cents per copy.

Vault Makers Cited by F.T.C. on Claims for Product's Worth

The Wilbert W. Haase Company, Inc., the American Vault Works, Inc., Baltimore Concrete Products Company, trading as the Baltimore Wilbert Vault Company and the Washington Vault Works, and their representatives have been found guilty as violators of the Federal Trade Commission Act and have been ordered by the Commission to cease and desist from representing directly or by implication:

(1) That such burial vaults composed in the major part of concrete or materials other than asphalt are asphalt vaults;

(2) That such burial vaults are dual vaults or that the asphalt inner lining of such vaults is an inner vault, either by the use of the terms stated or any other term or terms of similar import or meaning;

(3) That any such vault is "break-proof," or that "earth weight will not crush it," either by terms importing or implying that such vaults are not subject to being broken or crushed under any conditions of interment;

(4) That any such vault is "sweat-proof": or that any such vault constitutes "an eternal, dry underground mausoleum," either by the use of the terms stated or by in any manner representing, importing, or implying that such vault under any burial conditions will remain in sound water-proof condition, eternally or permanently, for 50 years or any fixed or stated period of time;

(5) That "the Aetna Insurance Company investigated every phase of the Wilbert organization" before entering into a contract of insurance with respect to such vaults or that the issuance of insurance "constitutes a remarkable endorsement of the vault," either by the use of the terms stated or any other term or terms of similar import or meaning;

(6) That insurance of the guarantee of such vaults under which any protection to the vault purchaser may be terminated at the will of respondents or, upon certain contingencies, by the insurer constitutes insurance of such guarantee for fifty years or for any other fixed or stated period of time.

The Buenos Aires office of the J. Walter Thompson Company has been appointed advertising agency for the Instituto de Cemento Portland Argentino, an organization formed by Argentinian cement companies to increase the use of cement.

Accept Proposal for Exempting Workers on Gravel Dredges

Acceptance of a proposal by the Wage and Hour Division regarding application of the exemption of seamen to employees on dredges and other floating equipment operated on navigable waters by the sand-and-gravel industry was agreed upon by marine-producer members of the National Sand & Gravel Association at a meeting in Washington, D. C., on July 23. The factors involved were discussed at a 3-hour conference, after which acceptance of the proposal was made known to Baird Snyder, deputy administrator of the Wage and Hour Division, who was present with Thomas McCormick, field liaison officer, at the luncheon session. The machinery for putting the proposal into effect is rapidly being set in motion, and complete details of the meeting and subsequent action will appear in the next issue of PIT AND QUARRY.

Those present at the meeting, including counsel for a number of firms, were:

V. P. Ahearn, executive secretary, National Sand & Gravel Association, Washington, D. C.

Paul P. Bird, Boston Sand & Gravel Company, Boston.

Thomas A. Butt, Smoot Sand & Gravel Corporation, Washington D. C.

H. P. Caldwell, Ohio River Sand Company, Louisville, Kentucky.

John Carmody, Smoot Sand & Gravel Corporation, Washington, D. C.

Steve Click, Louisville Sand & Gravel Company, Louisville, Kentucky.

Austin B. Cox, Dixie Sand & Gravel Company, Chattanooga, Tennessee.

Anderson Dana, Seaboard Sand & Gravel Company, New York.

H. S. Davison, J. K. Davison & Brother, Pittsburgh.

F. C. Fuller, Portsmouth Sand & Gravel Company, Portsmouth, Ohio.

Roy W. Harper, Dillman Industries, Caruthersville, Missouri.

Charles Hayes, counsel, National Sand & Gravel Association, Washington, D. C.

Miss C. M. Koch, Iron City Sand & Gravel Corp., Pittsburgh.

Jos. P. Lucas, Ohio River Sand & Gravel Corp., Parkersburg, West Virginia and McClain Sand Company, Point Marion, Pennsylvania.

Ruth Mitchel, Ohio River Sand & Gravel Corporation, Parkersburg, West Virginia.

John S. Montedonico, Greenville Sand & Gravel Company and Fischer Lime & Cement Company, Memphis, Tenn.

A. M. Parker, Smoot Sand & Gravel Corporation, Washington, D. C.

C. Z. Ruth, Kanawha Sand Company, Parkersburg, West Virginia.

G. Donald Schaub, Arundel Corporation, Baltimore.

C. C. Slider, E. T. Slider, Inc., Louisville, Kentucky.

Bertram M. Thomas, Warner Company, Philadelphia.

Stanton Walker, director of engineering, National Sand & Gravel Association, Washington, D. C.

Ray V. Warren, Pennsylvania Sand & Gravel Producers' Association, Pittsburgh.

Roger J. Whiteford, Smoot Sand & Gravel Corporation, Washington, D. C.

3-Day Strike Keeps Riverton Plant Idle

A three-day strike which kept 230 men idle at the Riverton Lime & Stone Company plant at Riverton, Virginia, ended with acceptance by the strikers of a company offer of a 3-cents-an-hour general wage increase and the adoption of the check-off system for payment of union dues.

Work was resumed after a conference between a shop committee, J. B. Foreman, representative of the United Stone & Allied Products Workers of America (C. I. O.); William E. Carson and Edward I. Williams of the company management, and John E. O'Connor, United States Department of Labor conciliator.

The increase makes the minimum pay for common labor 33 cents an hour and provides for an upward scale for other classifications.

Sets 34-Cent Minimum for Clay-Brick Workers

A wage order establishing a minimum wage of 34 cents an hour for the manufacture of bricks and other fired clay products (except refractories, pottery and ceramic whiteware), was issued August 15 by General Philip B. Fleming, Administrator of the Wage and Hour Division, U. S. Department of Labor, to go into effect September 1, 1941.

Foundry-Sand Maker Adds Blending Plant

The Great Lakes Foundry Sand Company, Detroit, has materially added to its Lake Cicott, Indiana, operations, according to W. J. Muhlitner, general manager.

A "tailor-made" molding sand is now being produced in a blending plant which controls the ingredients to suit the specific purpose for which the product is being made.

Fires Cause Damage at Indiana, Illinois and Arizona Plants

Fire of unknown origin destroyed one building and caused damage estimated at $500 at the plant of the East Peoria Sand & Gravel Company a few weeks ago. The master power switch was destroyed and halted production for a week until repairs could be completed.

About $1,000 damage resulted in a fire at the Linn Grove, Indiana plant of Meshberger Brothers Stone Company. An oil tank became ignited, spreading the flames.

Much machinery and equipment was ruined when flames partially wrecked the plant at the quarry of the Indiana State Penal Farm near Putnamville, Indiana. The damage was estimated at $30,000 by Glen Rowland, quarry superintendent.

At Tucson, Arizona, a small plant operated by the Pima Rock Company was completely destroyed with a loss of about $16,000, according to company officials. The plant had just started producing stone for the Tucson Army Air Base. H. J. Karns is the owner.

Workers Sue for Pay Under Wage-Hour Law

Thirty-nine employees of the Greenville Sand & Gravel Company and the Fisher Lime & Cement Company, Inc., of Greenville, Mississippi, have brought suit in federal court at Vicksburg, Mississippi, charging violations of the Fair Labor Standards Act.

The plaintiffs seek a total of $46,200.56, as payment for alleged violations by the companies. They charge they were not paid wages in accordance with the labor act, nor overtime when their employer was engaged in interstate trade.

Moves New York, Atlanta Offices to Chicago

The general offices of the International Agricultural Corporation, the Union Potash & Chemical Company, the Phosphate Recovery Corporation, and the Kyanite Products Corporation, formerly located in New York City and Atlanta, Georgia, have been moved to Chicago.

The concerns are occupying new offices on the twenty-ninth floor of the Civic Opera Building, 20 North Wacker Drive.

A new crushing plant has gone into operation near Williams, Arizona. It is owned and operated by the Del Massey Sand & Rock Company.

National Defense ★ ★ ★ ★ and Your Business

Aluminum from Alunite.—Secretary of the Interior Ickes has been informed by the Bureau of Mines that aluminum needed for defense can be obtained in quantity in the United States from domestic alunite deposits by a feasible process, partly freeing American production from present dependence on foreign bauxite supplies and limited native bauxite. Clays, as well as alunite, may possibly be utilized to produce aluminum. The bureau's metallurgists have concluded, from confidential data furnished them by a private research laboratory, that the aluminum from alunite ores can be used to produce an aluminum metal equal in grade to that produced by the standard processes. It can be made at a cost that would enable it to compete with aluminum made from bauxite.

Borax Priorities.—E. R. Stettinius, Jr., Director of Priorities, OPM, on July 30 extended to August 31 the order imposing priority control on borax and boric acid. Although the C.I.O. strike at the Trona, California, plant of the American Potash & Chemical Company—the cause of the original order—has been settled, the supply situation on borax has not returned to normal.

Car-License Plates.—The OPACS on August 8 asked state motor-vehicle authorities to require motorists to surrender their 1941 license plates upon receipt of new 1942 plates. The scrap metal is badly needed for defense work.

Defense Homes.—On July 24 President Roosevelt approved 21 new localities in which homes may be financed under the 90-per cent. mortgage-insurance provision known as Title VI of the National Housing Act. The following are the newly-approved areas and the defense activities most important in each:

Arkansas.—Little Rock; Camp Robinson, shell loading.

Florida.—Panama City, air-training school; Tallahassee, flying field; Valparaiso, Army air station.

Georgia.—Atlanta, air field; Fort McPherson.

Illinois.—Rantoul, Army flying school.

Indiana.—Evansville, ammonia.

Iowa.—Des Moines, small-arms ammunition.

Kentucky.—Henderson, ammonia.

Louisiana.—Lake Charles, magnesium, air-training school.

Massachusetts.—Lynn, airplane parts, electrical equipment.

Michigan.—Lansing, airplane parts, ammunition components.

Mississippi.—Columbus, air base; Greenville, air base.

Ohio.—Toledo, airplane parts, tanks, shells.

Oklahoma.—Oklahoma City, air base.

Oregon.—Astoria, naval air base, shipbuilding, Army air posts.

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MANPOWER

United States Army, Aug. 14	1,545,400
Navy and Marine Corps, Aug. 1	340,931
Non-agricultural workers, June	38,790,000
Per cent. increase since July, 1940	9.5
Sixteen defense industries, June	2,440,500
Per cent. increase since June, 1940	47.6

FINANCE

June 1940-July 1941—

Authorized program	$48,087,000,000

June 30, 1941—

Commitments for defense plant expansion	$3,402,000,000

PRODUCTION

July 1940-July 1941—

Paid on contracts	$6,325,000,000
Military aircraft in July	1,460
Combat vessels in July	20
Merchant ships in July	8

Week ended August 9—

	Strikes	Workers
Significant defense strikes in progress during week	9	26,925
Number settled	3	2,375

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Texas.—Freeport, magnesium, metal; Vernon, air-training school; Victoria, air-training school.

Alaska.—Fairbanks, Army air base.

The president also approved that day the construction with public funds of 2,865 homes for families of industrial workers and enlisted personnel in 8 localities as follows:

Permanent.—Manchester, New Hampshire, 85; Buffalo 200; Portland 85; Beaver County, Pennsylvania, 900; Fort Eustis, Virginia, 75; Seattle 700.

Temporary Shelter.—Weldon Springs, Missouri, 320; Ravenna-Warren, Ohio, 500.

Field Offices.—New field offices of the Priorities Division, OEM, were opened on August 7:

Kansas City, Mo.—Clifford H. Carr, assistant district manager (Kansas, Nebraska, Oklahoma).

Los Angeles, Cal.—G. Howard Hutchins, district manager, 1151 South Broadway.

Seattle, Wash.—William D. Shannon, district manager, Stuart Building.

Gasoline Restrictions.—Because of the failure of voluntary coöperation by dealers and the public in view of the shortage of transportation facilities for moving gasoline to the Atlantic Coast area, deliveries of gasoline from suppliers were limited on August 16 to 90 per cent. of the July level by Administrator Henderson of the OPACS on the recommendation of Harold L. Ickes, Petroleum Coördinator for National Defense. Deliveries to certain users whose needs are essential will not be reduced beyond "minimum necessary requirements." These certain uses include:

1. The operation of commercial vehicles so classified by law.
2. The operation of vehicles necessary for the public health or safety, including ambulances and vehicles operated by physicians.
3. The operation of farm machinery and motor trucks used for farm purposes.
4. The operation of vehicles owned or operated by federal, state, or local governments.

All other uses will, therefore, actually be reduced by more than 10 per cent.

Eleven oil companies have submitted to Mr. Ickes a proposal to build an 1,820 mile pipe-line to provide the New York-Philadelphia area with 250,000 barrels of crude oil daily. Construction, even if started immediately, would require 9 months. Mr. Ickes also has under consideration an application to secure the necessary rights-of-way, as provided in the Cole Pipe Line Act, for a 1,200-mile line from Baton Rouge, Louisiana to Greensboro, North Carolina. Most of the materials are available, construction contracts have been let, but it has been impossible to get certain portions of the right-of-way, particularly in Georgia.

Locomotive Repairs.—On July 21 the Priorities Division of the OPM issued two orders granting a preference rating of A-3 to an initial list of 10 locomotive builders and also to about 60 repair plants. One of the orders grants a rating for delivery of material entering into the repair and rebuilding of steam, electric or Diesel locomotives, whether for railroad, mining or industrial use. The other order grants a rating for delivery of materials entering into the construction of specified locomotives now scheduled by the builders.

Lubricant Prices.—Administrator Henderson of the OPACS has asked leading oil refiners producing Pennsylvania-grade lubricants to base prices on 33 cents a gallon for the dominant grade, 200 Pennsylvania neutral, 25 pour test, and to maintain current price differentials for the other grades of neutrals. A succession of increases in recent months has carried refinery prices from about 22 cents a gallon to 42 cents and higher.

Maintenance-and-Repair Priorities.—Although not included in the list of 9 industries announced August 8 by E. R. Stettinius, Jr., Director of Priorities, as affected by a new maintenance-and-repairs rating plan, quarries are one of the second group of 9 industries to be brought under the plan as soon as the Priorities Division can handle the needs of the first group. The first 9 industries to enjoy the benefits of recognition as industries "essential to the national-defense program" are:

1. Commercial air lines maintaining regular schedules.
2. Explosives-manufacturing plants.
3. Metallurgical plants producing metals and alloys.
4. Mines; ore dressing and processing plants; smelting facilities.

5. Federal, state, county and city service—fire, police; electricity, gas, water, sewerage; urban, suburban and interurban electric railways and urban and suburban motor and electric coach.
6. Public utilities (privately-owned)—electricity, gas, water and sewerage service.
7. Railroads.
8. Coke converters.
9. Common-carrier passenger transportation—urban, suburban and interurban electric railways; urban and suburban motor and electric coach (privately-owned).

The 9 industries next to be affected are:

1. Ammonia plants, producing principally for refrigeration.
2. Chemicals made by the chemical processing of raw materials.
3. Food processing and storing—producing, milling, preserving and wholesaling.
4. Hospitals, clinics, and sanatoria.
5. Intercity motor-coach common-carrier passenger transportation.
6. Quarries.
7. Radio commercial communication—commercial broadcasting, but not home receiving sets.
8. State, county, and municipal services—common-carrier and school buses; highways; hospitals, clinics, and sanatoria; public buildings, institutions, schools, and parks; street-railway, trolley-bus, subway, and elevated lines.
9. Telephone and telegraph communication.

Those granted the use of the plan will get an A-10 rating which they can apply to their orders for necessary repair and maintenance parts. The A-10 rating is not automatically available to any producer, manufacturer, or agency in one or more of these classifications. Before any person may use the rating, he must apply for its use on a special form—PD-69—which may be obtained by writing to the Priorities Division, Attention, Maintenance and Repairs Section, 462 Indiana Avenue, Washington, D. C., or by writing to any one of the Priorities Division field offices. Copies of application forms are now available in these offices.

If an application is granted, the approved firm or agency will receive an authenticated copy of the new order (P-22-a).

Each producer or agency granted the use of the rating must agree to its terms in writing, executing a copy of the order and filing it with the Priorities Division, before the rating can be applied.

Each order issued will bear a serial number. The rating can be applied by executing a copy of the order, inserting the serial number, and serving it on the supplier. Additional orders placed with suppliers must be identified by insertion of the number assigned.

The plan includes provisions so that a supplier, when served with a preference-rated order, may in the same manner extend the rating to his own suppliers. Printed copies of the order for such purposes may be obtained at field offices or from the Priorities Division in Washington.

Although the rating to be used generally is A-10, a special emergency rating of A-1-a may be assigned within the nine industrial classifications named in cases of extreme urgency. This rating may be used, however, only when telegraphic applications have been granted.

The A-10 rating can be applied only to deliveries of maintenance and repair parts, as defined in the order, to be used in the plant which has been granted the rating. It may not be used to obtain materials flowing into production, may not be used to obtain excess inventories of maintenance and repair parts, and may not be used to obtain parts or materials for plant expansion.

Representatives of the Priorities Division and the Office of Price Administration and Civilian Supply (OPACS) have worked out the plan and have agreed on the initial nine industrial classifications to be included. As the plan gets under way other industrial classifications will be added to the list and announcements will be made of all such additions.

The new plan will not only benefit essential industries which have need of repair and maintenance parts, but will also aid some suppliers and producers to qualify under the Defense Supplies Rating Plan, which provides special ratings for certain producers based on that percentage of their production which is clearly covered by defense orders.

If a supplier accumulates a number of preference-rated orders under the maintenance plan, for example, he can then use these orders in calculating the percentage of his business which is defense. When such a supplier can demonstrate that a substantial percentage of his business is defense, he can then enter an application for use of the Defense Supplies Rating Plan.

An example of how the maintenance and repair plan will work in a typical case is as follows:

Suppose a plant in one of these 9 industries applies for and is granted the use of the plan. A little later a pump in the plant wears out and a new valve is needed. The plant can then serve its preference-rating order on its supplier of valves. The supplier will have to recognize the preference rating in meeting the required delivery date. The supplier will also be benefited because he can either extend the rating directly or can use the order served on him in qualifying under the Defense Supplies Rating Plan.

If the same plant needs additional valves in the future, it can apply the rating by citing the original order's serial number in placing contracts.

Field offices of the Priorities Division, and the Field Service district managers from whom information about the plan may be obtained, are:

Atlanta, Ga.—John B. Reeves, Federal Reserve Bank Bldg.
Boston, Mass.—William P. Homans' 30 Pearl St.
Chicago, Ill.—Warren G. Bailey, 230 S. La Salle St.
Cincinnati, Ohio.—Bruce W. Burroughs, Union Trust Bldg.
Cleveland, Ohio.—William T. Walker, E. 6th St. and Superior Ave.
Dallas, Tex.—James B. Crockett, Wood and Alkard Sts.
Denver, Colo.—Virgil Board, 17th and Arapahoe St.
Detroit, Mich.—Walter Hall, 160 Fort St., W.
Kansas City, Mo.—Clifford H. Carr (assistant district manager Federal Reserve Bank Bldg.
Los Angeles, Cal.—G. Howard Hutchins, 1151 S. Broadway.
New York, N.Y.—Phillip M. McCullough, 33 Liberty St.
Philadelphia, Pa.—Frederick W. Slack, 925 Chestnut St.
Pittsburgh, Pa.—Charles C. Cruciger, Grant St. and Ogle Way.
St. Louis, Mo.—Louis E. Crandall, 411 Locust St.
San Francisco, Cal.—Andrew L. Kerr, Federal Reserve Bank Bldg.
Seattle, Wash.—William D. Shannon, Stuart Bldg.

Nonmetallic - Minerals Technical Committee.—To advise the OPM on nonmetallic minerals the creation of a special technical committee was announced August 15 by E. R. Stettinius, Jr. This is a special sub-committee of the Advisory Committee on Metals and Minerals appointed by the National Academy of Sciences. The new nonmetallic minerals group, which is preparing reports for the OPM on graphite, mica, asbestos, and other strategic minerals, has the following membership:

R. P. Heuer, *chairman* (General Refractories Co., Philadelphia).
Paul Tyler, *secretary* (U. S. Bureau of Mines, Washington, D. C.).
L. E. Barringer (General Electric Co., Schenectady, N. Y.).
G. A. Bole (Orton Ceramic Foundation, Columbus, O.).
B. C. Burgess (United Feldspar and Minerals Corp., Spruce Pine, N. C.).
W. S. Landis (American Cyanamid Co., New York, N. Y.).

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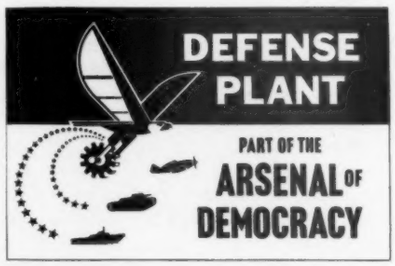


Companies devoting at least 50 per cent. of their facilities to defense production were authorized August 9, by Director General William S. Knudsen of the OEM, to display this sign during the time when defense contracts are in effect. The sign is in three colors and is 6 by 4 feet in size and can be constructed and displayed by any such contractor or sub-contractor.

EDITORIAL

Defense for War—VIII

PEOPLE in difficulty are prone to wish for some simple solution instead of applying themselves to the severe task of analysis before action. The large number of Americans who still believe—because they hope—that "something will turn up" to stop the wave of international murder and madness that afflicts the world, that it is not necessary to make any preparations for a conflict which, having affected most of Europe and large parts of two other continents, seems certain to spread to the western hemisphere, that if we "just sit tight and wait" time will effect a cure, are deriving great comfort these days from the reports of *sabotage* that continue to come through from the conquered countries. Every fresh account seems to confirm them in their "conviction" that "this thing can't possibly go on much longer," that "something will happen soon," even that "God himself must soon intervene and stop this senseless slaughter." Meanwhile the war spreads, weeks draw out into months, and the conflict enters its third year.

We, too, of course, are affected by these fragmentary stories of passive resistance and of growing resentment and courage on the part of the enslaved peoples of the world. We, too, are heartened when we hear of the nervous breakdown of German officers in occupied countries because of the scorn, contempt and hatred that glower at them from the eyes of their victims; of Norwegian actors of stage and screen and athletes and other performers who have refused to participate in public activities until their country is rid of the German oppressors; of the thousands of people in occupied France who openly listen to the short-wave broadcasts from Boston and London, accompanied often by German soldiers who hunger for something besides the "information" given them by their own government's propaganda spokesmen. It is cheering to know that, in Czechoslovakian factories working for the Germans, important tools and dies frequently disappear and must be replaced; that the British or the Free French forces of de Gaulle smuggle into occupied territories explosives with which essential railway lines are destroyed and warehouses and their contents seriously damaged.

Even though all the stories told do not in the aggregate tell of *sabotage* on a scale serious enough to act as a real deterrent to Axis aggression, the hopeful among us habitually multiply them by a factor that varies with our optimism, until one could easily get the impression that the German system of policing Europe is breaking down, that opposition is open and effective everywhere, that the millions of people enslaved by German ambition are not content and will soon throw off the yoke of oppression. To freedom-loving people, especially to those in a country where the highest executive in the land is showered with the vilest kind of abuse in the name of "freedom of speech," it is incredible that self-respecting persons anywhere could tolerate the hardships imposed on them by a brutal conqueror.

Meager as these reports may be, they exert an influence out of all proportion to their importance. They break down the resolution of some people in this country, people who need all the firmness of opinion and readiness of decision that they can muster to offset the appeals to indifference, aloofness and mental indolence that assail them from every side. These reports seem to lend the color of plausibility to claims that the present conflict is not in reality World War II, but a struggle between rival economies in a Europe that "has always been, and always will be, torn by fighting"; not a war for domination of the world by a highly efficient and utterly conscienceless revolutionary party, but a "back-yard squabble" that can be confined within a small area and is of no concern to neighbors in other parts of the world.

In the beginning of the war the first British planes flying over Germany dropped leaflets appealing to the German people's sense of liberty and disclaiming any intention of hurting or exterminating them. It was *naively* believed that the Germans had the same love of freedom as the English and that successful revolution was easily within their grasp. To-day such expectations are recognized for what they are, the vain hopes of a people who still do not understand the thoroughness with which the Germans had been made impotent by their government. It took a long time to realize that a people armed with clubs is no match for a fully equipped and highly mechanized army, that there is no opportunity for the organization of opposition in a country where every public official is watched by a party spy assigned to that specific job; wherein every city and village block is under the surveillance of a party agent; where two persons can not speak together without the fear that what each one of them says will be reported to the secret police by some hidden watcher or even by the other party to the conversation; where it seldom happens that a smuggled letter or foreign newspaper can be read and passed around; where the death penalty awaits anyone caught listening to foreign broadcasts. Even if there were "another Germany," a Germany fired with the glow of democracy and revolution—and there are only very weak reasons for supposing that there is—it would be impotent under such strict suppression. The Germans are not a revolutionary type of people; they accept authority gladly; they delegate political action unreservedly to their leaders. If the present *régime* in Germany is to be overthrown, the Germans would rather see it done by others than do it themselves.

THOSE of us who shrink from taking a firm mental stand against the tyranny that, if not checked, will engulf this hemisphere no less completely than it has the most important parts of the other; those of us who sit back contentedly behind the supposed impregnability of two oceans waiting for the weakened and all-but-exhausted victims of its viciousness to cast it off; those of us who fall into this slipshod type of thinking ignore the realities of the situation. The German people live under a *régime* which is so powerful as to be seemingly unassailable; they do not have the revolutionary mentality; for eight years they have been kept from contact with political ideals that might inspire them to action. The Germans can not be counted on to bring about themselves the end of the despotism which even the muddled thinkers and faint-hearted among us so earnestly desire.

Piney River Plant Processes Virginia Aplite; Mineral Used in Glass-Making

By W. E. TRAUFFER

THEY say there is nothing new under the sun. This is doubtless true with certain limitations and perhaps modifications. For instance, the mineral aplite is new to many but in reality is as old as the oldest igneous rocks.

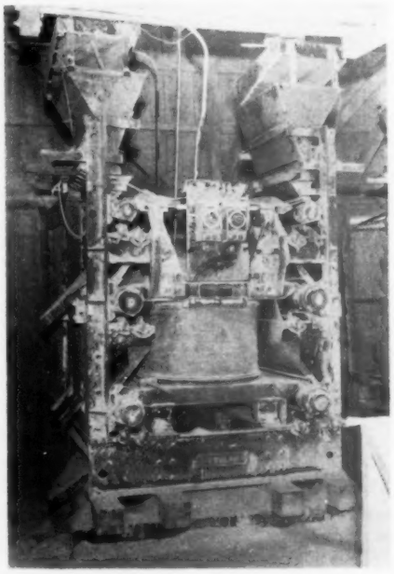
Aplite is one of the less common nonmetallic rocks. It is a complex silicate containing four important minerals: albite, microline, sericite and zoisite. All four minerals contain, in addition to silica, certain percentages of alumina, calcia, potash and soda. A representative chemical analysis follows:

Silica—60.20 per cent.
Alumina—24.14 per cent.
Ferric oxide—9.26 per cent.
Calcia—6.11 per cent.
Soda—5.60 per cent.
Potash—3.19 per cent.
Loss on ignition—0.50 per cent.

This mineral is used in the manufacture of glass containers and a few other types of glass, including window glass, glass fibers, etc. The glass manufacturer desires a certain percentage of alumina in the finished glass, as the aluminum oxide acts in the capacity of a chemical fixing agent, thus making the glass more stable and less soluble, increasing its viscosity at molding temperatures, and, probably, increasing the mechanical strength of the finished glass articles.

The Virginia aplite deposit was first operated in the autumn of 1938 by Dominion Minerals, Inc. of Washington, D. C., which pioneered the development in Nelson and Amherst Counties, Virginia. It was learned soon after the operation was started that the rock had certain properties, such as extreme hardness, lack of definite cleavage and excessive abrasiveness, that made ordinary quarrying and milling very difficult and expensive.

The crushing-and-screening buildings with conveyor leading across Piney River at right.

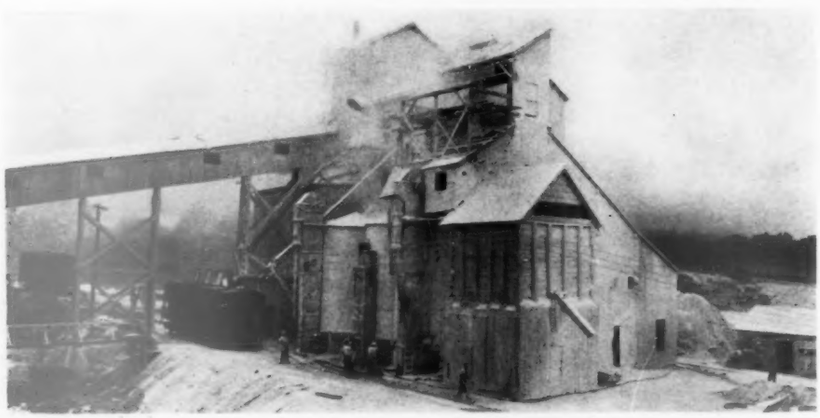


One of the magnetic separators.

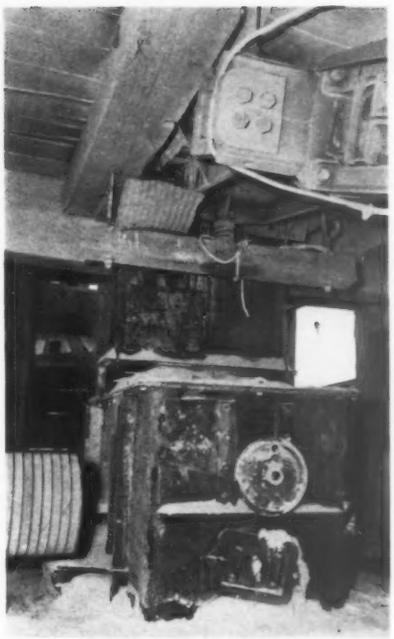
After operating for about eight months the company redesigned its mill and increased its capacity. At present it is making changes in the location and type of the grinding units with the hope of stepping up production to somewhere near the rated capacity of some of the grinding machines.

The overburden, composed principally of decomposed aplite, varies from 6 feet to 25 feet in depth and will average about 15 feet. It is removed by a Caterpillar tractor and a Le Tourneau scraper. The quarry has been developed with a 40-foot face and the seamy formation makes drilling and blasting very difficult. Ingersoll-Rand X71 wagon-drills are used on the face and S68 Jackhamers for secondary breakage. This material is very abrasive and the detachable drill bits are replaced after every 8 to 10 inches of hole depth. Twenty-, 40- and 60-per cent. explosives are used and the total yield averages about 1½ tons per pound.

A Marion 1½-cubic yard steam shovel loads two International 3-ton dump trucks which haul the rock to the plant. A 36-inch by 12-foot apron-feeder carries this material to a 24- by 36-inch Farrel-Bacon jaw crusher. A 32-inch by 119-foot belt-conveyor carries the crushed rock to a 4- by 10-foot Telsmith 3-deck vibrating screen. The material passing over the top deck of this screen drops into a Telsmith 36-inch Gyrasphere crusher; that passing over the middle and bottom decks



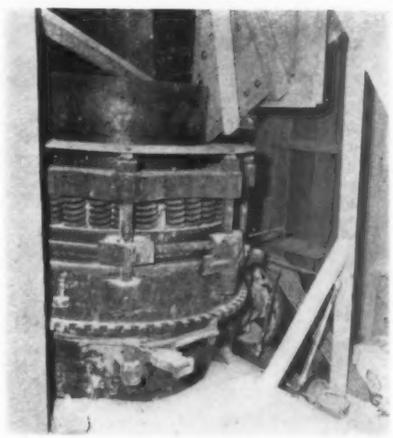
The main plant building with conveyor from crushing building at left.



The hammer-mill used as a reduction unit with electric vibrating feeder above.

drops into a No. C37 Pennsylvania Impactor crusher. The products of both crushers are carried on a 30-inch by 90-foot belt-conveyor back to the main conveyor.

The minus 5/16-inch material falling through the bottom deck of the screen is carried on a 20-inch by 190-foot inclined belt-conveyor across Piney River to the main plant building, where it is discharged into a Kennedy-Van Saun tower drier 40 feet high. This drier has horizontal rail baffles arranged in cross sections and is wood-fired. The temperature at the top of the drier is



The 36-inch reduction crusher with V-belt drive at right.

kept at 100 to 150 degrees F. The raw rock from the quarry usually has at least ½ of 1 per cent. of surface moisture and this is removed in drying to insure uniform results in subsequent processing. The raw rock can, if desired, be discharged from the above conveyor into a 15- by 30-foot concrete tank which acts as a reserve or surge storage ahead of the drier. A Jeffrey Traylor vibrating feeder discharges the stored rock on a belt-conveyor followed by a bucket-elevator which discharges it into the drier.

The dried rock is discharged to a bucket-elevator which drops it over a pair of Jeffrey-Traylor 48- by 96-inch Conveyanscreen single-deck electric vibrating screens. The plus 20-mesh oversize from these screens goes to a 15- by 30-foot concrete storage tank. A Jeffrey-Traylor vibrating feeder controls the rate of discharge from this tank to a conveyor and elevator in series and then feeds a Sturtevant No. 2 ring-roll mill. The product of the mill is elevated to a 4- by 10-foot Tyler Type

Shovel loading truck in quarry.

Compressor and its 100-horsepower motor drive.

38 Hum-mer 2-deck screen. The material passing over both docks is returned to the mill.

The minus 20-mesh material falling through the bottom deck of this screen, with that through the bottom decks of the two Conveyonscreens goes to an elevator, from which it can be loaded by gravity into cars for shipment.

This material can also be fed from the elevator to a 10-foot Gayco mechanical separator which removes all the minus 200-mesh material. A limited amount of this fine material is sold for use as asphalt filler. The surplus, wasted, is stock-piled by trucks.

The 200- to 20-mesh product of the separator is elevated to a 15- by 20-foot concrete tank, from which another elevator feeds it to a pair of Exolon double, 30-inch, Type D magnetic separators. These remove all the free iron accumulated in the processing and some of

The 24- by 36-inch primary jaw crusher.

the accessory iron-bearing minerals in the rock. The product goes by gravity into a 15- by 20-foot concrete tank from which it is loaded into cars.

The crushing department now has a capacity of 15 tons per hour of minus 5/16-inch rock. The finishing plant has a capacity of 8 tons per hour and the two magnetic separators have a combined output of 4½ tons per hour. The equipment now being added includes two more Exolon magnetic separators, another finishing unit, an 8-foot Gayco separator, and Sly dust-collectors.

The process water is obtained from the Piney River. Air for all the operations is supplied by a Gardner-Denver 14- and 8¾- by 10-inch air-compressor.

The triple-deck screen which splits the rock fed to the two reduction crushers.

Raleigh Granite's New Crushed-Stone Plant at Greystone

View from top of quarry face looking down on well-drills on second level and shovel and trucks on quarry floor. In background are the primary crusher, stock-pile and part of the plant.

By W. E. TRAUFFER

ONE of the most interesting of the new crushed-stone plants built in recent years is that of the Raleigh Granite Company at Greystone, North Carolina, which went into operation in January 1941. This 300-ton-per-hour plant incorporates many refinements of design which definitely stamp it as a well-designed modern operation. Among its features are the location of the primary crusher in the quarry, the use of trucks and semi-trailers in a loop haulage system, and a tower system of storage and reclamation. An unusual feature is the storage tunnel over the conveyor from the quarry. Excess stone is stock-piled over this tunnel and can be reclaimed through it.

The Raleigh Granite Company is one of the largest aggregate producers in the South and one of the oldest. At present it operates five crushed-stone plants in North Carolina and one in South Carolina. This company was formed in 1916 and in that year built its first plant at Greystone near the plant with which this article is concerned. This quarry has been operated previously for a few years for the production of dimension and crushed stone. The company's original plant was replaced in 1923 with one of all-concrete construction which was one of the best of its day. In 1927 the derrick system of bringing stone out of the quarry was replaced by locomotives and cars with an incline to the plant. A new and larger primary crusher was also installed. The plant was improved and enlarged several times up to late in 1940, when it was shut down and dismantled. The present new plant went into operation in January 1941.

The deposit is a hard granite with from 4 to 12 feet of overburden, which is removed by a shovel and trucks. An 85-foot level was worked for many years, but recently a second 85-foot level was opened. This will be developed to the same area and then the entire 170-foot face will be developed further. The drilling is done by two 6-inch Sanderson Cyclone well-drills. Du Pont Nitramon is used in single-row shots of up to 35 holes each. The secondary drilling is done with jack-hammers.

Two Bucyrus-Erie 50-B shovels, one Diesel and the other electric, are used for loading. The stone is hauled to the primary crusher in four Easton Model TR 10 Phoenix 10-cubic yard semi-trailers, which are drawn by Ford cab-over-engine tractors specially built for this purpose and having Eaton 2-speed rear axles. The average length of haul is about 500 feet one way. The contents of the trailers are dumped from a ramp by means of an Easton elbow-type automatic dumper which is operated by one drum of a 2-drum Lidgerwood hoist. Outrigger arms extending from the frames of the semi-trailers rest on a concrete wall at the crusher and take the shock load of dumping off the tires. The second drum of the hoist operates the stone hook. A permanent record of quarry operations is kept by a Bristol recorder which automatically

View looking down from the screening tower at the secondary and reduction crushers.

Looking down the main conveyor from the quarry toward the stock-piling tunnel.

One of the shovels loading a 10-cubic yard semi-trailer in the quarry.

registers each load of stone and the time of its arrival. Delays are checked and the reasons for them are entered in detail on the chart.

The 48- by 60-inch Allis-Chalmers primary jaw crusher reduces the stone to 6-inch size and under. A 42-inch by 550-foot inclined belt-conveyor carries the stone from the quarry level to ground level. For 340 feet of its length this conveyor is inclosed in a concrete tunnel. The conveyor discharges the stone on an inclined stationary scalping screen with 4-inch round perforated openings. The oversize rock drops into a 5½-foot Symons standard cone crusher which reduces it to 3-inch size and under. The rock falling through the scalping screen and that from the crusher come together on a 36-inch by 152-foot belt-conveyor. This material is discharged through a split chute to a pair of 2-deck screens, one a 5- by 12-foot Tyler Ty-Rock and the other an Allis-Chalmers Type B machine. These screens usually have 2¼-inch and 1⅛-inch openings on their top and bottom decks, respectively. The oversize is discharged into a pair of Symons 4-foot cone crushers which reduce it to ¾-inch size and under. The product of these crushers can be discharged on a 36-inch by 160-foot inclined belt-conveyor which discharges the stone to a stock-pile over the tunnel described above. The oversize stone on the conveyor to these screens can, if desired, be made to by-pass the screens through a chute to this stock-piling conveyor. If desired, the stone from the crushers can be discharged on a short belt-conveyor which returns it to the belt-conveyor feeding the two screens.

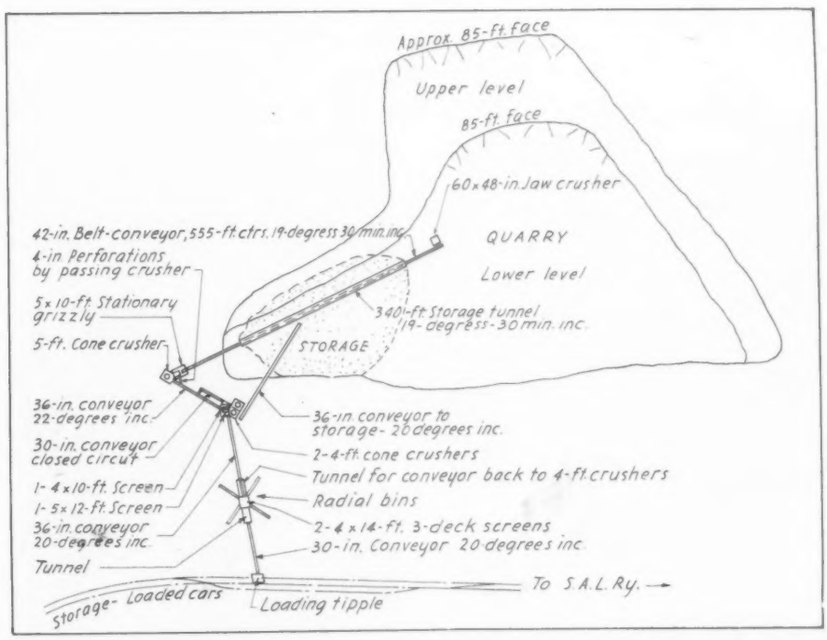
The concrete tunnel is in a sloping depression in the quarry face. The stock-pile will ultimately have an estimated capacity of 175,000 tons. A rip-rap wall at the quarry level is being built to a height of 23 feet to keep dead storage at the minimum. If it ever should be necessary, the material in dead storage can be loaded by the shovels into trucks and discharged on the main conveyor without going through the primary crusher. The drop from the end of the conveyor to the top of the tunnel at a point directly under it is 103 feet. It is estimated that about 50,000 tons of stone can be reclaimed through the tunnel without rehandling. There are openings and gates at 12-foot intervals in the tunnel.

All the material passing through the top decks of the two screens is usually discharged on a belt-conveyor to the top of the screening and storage tower but that retained on their bottom decks can, if desired, be diverted through a special gate to the stock-piling conveyor.

The 5½-foot secondary cone crusher which reduces oversize from scalping screen.

The 36-inch by 240-foot tower conveyor discharges the stone into a box, where sprays soak it thoroughly before it is discharged on the 4- by 14-foot Tyler Ty-Rock 3-deck vibrating screen. This screen usually has 1- and ¾-inch openings on its first two decks and 6 feet of ⅛-inch and 8 feet of ½-inch openings on its bottom deck. The four sizes of stone produced are discharged into the four radial storage compartments. The stone sand passing through the ⅛-inch screen section is flumed to a separate pile.

The four concrete wings forming these storage compartments are 30 feet high above the top of the reclaiming tunnel and are 43 feet long. A Thew Lorain 40 gasoline crawler crane, with a ¾-cubic yard clam-shell bucket, is used to move material in storage and



This sketch gives a general idea of the lay-out of the quarry, conveyor systems and the plant.

Close view of gates and conveyor under radial-storage tower. Note special prong gate at right.

The 4-compartment radial-storage tower with final-sizing screen above. Reclaiming conveyor is at left.

makes possible a total storage capacity of 7,000 tons. Under each of the compartments is a chute, and through these four points about 3,000 tons of material can be reclaimed without rehandling. Three of the chutes are equipped with radial gates which open from the weight of the material and are closed by means of cables. As there was not enough space for such a gate on the 1-inch stone chute one was designed with 10 steel prongs on 1½-inch centers. These prongs fit into holes in the bottom of the chute. An attached weight opens this gate and a cable is used to close it.

All four of the gates are controlled from the loading-out building by cables attached to levers. These levers are so marked that any desired blend of two or more sizes can be made. Nine different blends are now being called for. A 36-inch by 146-foot inclined belt-conveyor carries the stone, in single or blended sizes, to the loading-out building where it is split to a pair of rinsing devices. Each of these machines can discharge the stone through either of two chutes into cars on the two loading tracks. These tracks have space for 90 empty and 90 loaded cars, which are moved by gravity.

Almost the entire output of the plant is used for railway ballast and highway work and is shipped by railway. Trucks can be loaded, however, either through the chutes or by the crane at the storage tower. Truck shipments are weighed on a 20-ton Fairbanks scale with a 34-foot platform. This scale is housed in a new 3-room office building which is modern in every respect. An interplant telephone system with 7 stations connects the office, machine shop, loading tower, the three crushing stations, and the main tunnel.

All the inclined belt-conveyors in this plant are flat or nearly so at their loading points. The main conveyor from the quarry, for example, has a slope of 6 degrees under the crusher and one of 19 degrees and 30 minutes for the rest of its length. This conveyor carries a 9-ton load of stone when fully loaded. Most of the conveyors are carried on 44-foot-span steel trusses which came from the Century of Progress Exposition in Chicago. All the belt-conveyors are equipped with automatic safety brakes and all the equipment can be stopped from central or local switches. Quaker City conveyor belting, Chain-Belt Rex Stearns idlers and pulleys, and National wire screen cloth are used.

The wash water used in this plant is secured from a dam in a near creek. An Allis-Chalmers 1,200-g.p.m. centrifugal pump moves the water 2,760 feet

The radial-storage tower with re-rinsing and loading building in background. Note "Century of Progress" conveyor trusses.

The 4- by 14-foot 3-deck final-sizing screen on the top of the radial-storage tower.

Another view in quarry showing semi-trailer being dumped by elbow-type mechanism. The main conveyor tunnel and stock-piling conveyor are in background.

At right is the main conveyor from the quarry and the secondary crushing department. At left are the two screens over the two reduction crushers and the return conveyor.

to a pond near the plant. Three 800-g.p.m. Allis-Chalmers centrifugal pumps, connected to a single pipe-line, supply water to the plant.

Compressed air for the quarry and other operations is supplied by a 1,250-c.f.m. Ingersoll-Rand Type 10 compressor in the shop. The shop equipment includes 42- and 20-inch lathes, a milling machine, a drill-press, a shaper, a threader, etc.

The major equipment units are driven by the following means:

Primary crusher by a 200-horsepower Allis-Chalmers 3-bearing motor through Gates V-belts.

Main conveyor by a 150-horsepower Crocker-Wheeler motor through Gates V-belts and gears.

5½-foot cone crusher by a 150-horsepower General Electric motor-direct.

Return conveyor by a 50-horsepower General Electric motor through Gates V-belts.

Conveyor to screens by a 30-horsepower General Electric motor through Gates V-belts.

2 Sizing screens by two 10-horsepower Westinghouse motors through Gates V-belts.

2 4-foot cone crushers by two 100-horsepower General Electric motors direct.

Conveyor to tower by a 50-horsepower General Electric motor through Gates V-belts and gears.

Tower screen by a 10-horsepower Westinghouse motor through Gates V-belts.

Loading-out conveyor by a 40-horsepower through Gates V-belts.

Air-compressor by a 210-horsepower General Electric through a belt.

Water pump by a 210-horsepower General Electric direct.

Defense (from page 42)

M. M. Leighton (State Geological Survey Division, Urbana, Ill.).

G. R. Mansfield (U. S. Geological Survey, Washington, D. C.).

Oliver C. Ralston (U. S. Bureau of Mines, College Park, Md.).

Robert B. Sosman (United States Steel Corp., Kearney, N. J.).

John F. Sullivan (Battelle Memorial Institute, Columbus, O.).

Frank J. Tone (Carborundum Co., Niagara Falls, N. Y.).

William M. Weigel (Missouri Pacific Railroad, St. Louis, Mo.).

R. B. Wittenberg (International Agricultural Corp., New York, N. Y.).

Plant-Expansion Certificates. — The NDAC issued the following certificates of necessity for plant expansion to producers of nonmetallic minerals during July:

Mexico Refractories Co., Mexico, Mo.—Fire bricks, $200,000.

Monsanto Chemical Co., St. Louis, Mo.—Phenol, $435,000; chemicals and oils, $1,865,000.

Mulliter Refractories Co., Shelton, Conn.—Fire bricks, $44,000.

Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.—Dolomite, $14,000.

Solvay Process Co., Syracuse, N. Y.—Chemicals, $631,000.

Southern Asbestos Co., Charlotte, N. C.—Asbestos products for shipboard use, $67,000.

Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.—Forging of shells, $434,000.

United States Gypsum Co., Chicago, Ill.—Roof decks, $28,000.

Tire and Tube Prices.—The rise in the prices of tires and tubes, allowed their manufacturers by OPACS Administrator Leon Henderson because of a demonstrated increase in material costs for rubber and fiber, will not raise costs to retailers by more than 5 per cent. for any tire or tube and does not warrant an increase beyond 5 per cent. in the retail prices to consumers, according to the OPACS.

Tire Restrictions.—Effective August 23, the manufacture of white-sidewall tires has been prohibited by Priorities Director Stettinius as each such tire contains about two pounds more crude rubber than one of the ordinary kind. The order is expected to result in the saving of more than 13,000,000 pounds of crude rubber a year.

LEFT—Dolomite-rock sand for concrete, produced on the east bank of the Hudson River, magnified to about 15 times actual size.

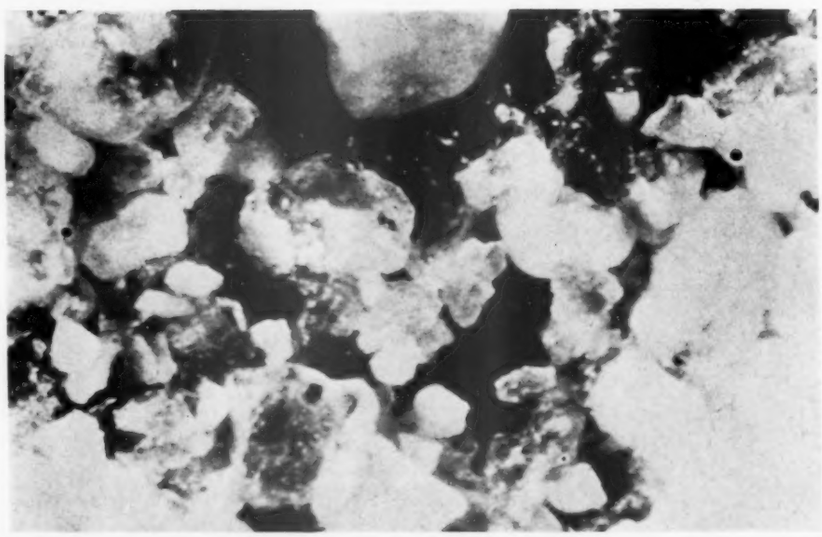
photomicrographer and the sand producer should be 100 per cent. honest in this. Fracture, sharpness and color value, however, are truly recorded by the camera, regardless of the method of sampling.

Mere photographic enlargements are not sufficiently sharp, nor do they have adequate focal depth to show the characteristics of the sand properly. The writer, who made the photomicrographs which illustrate this article, used a specially built camera with 24 feet of bellows extension and a long-focus lens stopped down to *f*:128. The specimens of sand were mounted on ½- by ⅜-inch bits of cardboard which were first coated with glue.

Photomicrographs Help to Sell Right Kind of Sand

By SPENCER JONES

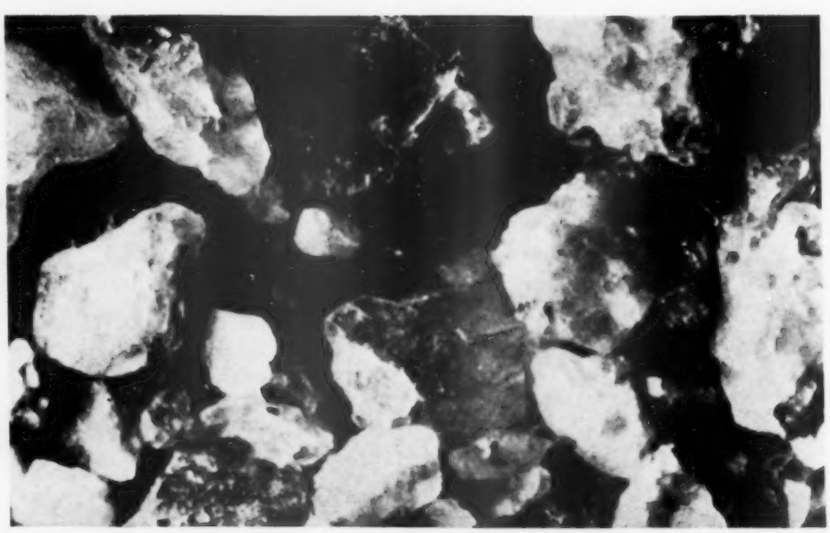
PHOTOMICROGRAPHS have been found to be excellent sales ammunition for persuading prospective customers who are undecided as to what sand to buy. Carefully selected samples, chosen so as to be truly representative of the various sands under consideration, are photographed 15 times actual size. The prospects are then shown the photomicrographs and the salesmen point out the visible superiorities of the sand they wish to sell.



RIGHT—Typical waterworn sand, as the well-rounded particles would indicate, composed very largely of granite and quartz. It has a tawny color and is highly regarded by architects and contractors within its shipping radius. Magnified about 15 times actual size.

Such features as type of fracture, sharpness of grains, proportions of different sizes, and lightness or darkness are clearly shown in the photomicrographs. One sand manufacturer equips each salesman with a sales portfolio or visualizer containing samples of each grade of sand he has to offer; samples of competitive grades; and photomicrographs of the leading sands of his own and competitive production.

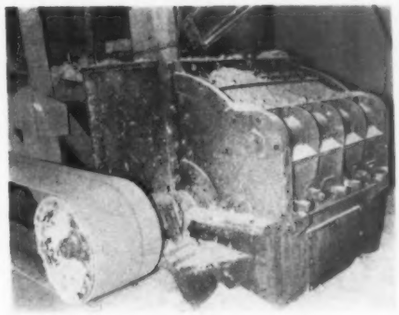
Comparisons of the relative proportions of different sizes in a sand depend entirely on the samples submitted to the



RIGHT—A gneissoid granite rock sand. Note the somewhat roughly cubical appearance of the particles and compare with the flat or silvered fracture of sand made from homogeneous rocks such as trap and dolomite. This microphotograph is 15 times the actual size of the specimen.

By W. E. TRAUFFER

RIGHT—The plant as seen from the quarry. BELOW — The hammer - mill used for secondary crushing.



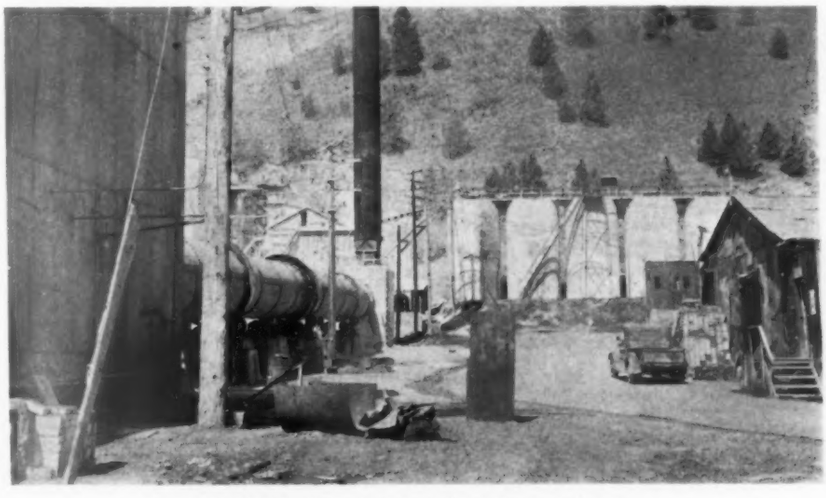
Small Cement Plant in Idaho Carries on Progressive Improvement Program

THE Washington-Idaho Lime Products Company created considerable interest in the cement industry when its new cement plant at Orofino, Idaho, went into operation late in 1935. A complete description of this plant was published in the October, 1935, issue of PIT AND QUARRY. The interest in this plant was due particularly to its small size (only 175 barrels per day capacity) and the fact that it was built to serve a limited territory. Some predictions were heard at the time that this plant was the forerunner of other small plants to be built in territories far from existing plants, a condition which has not yet developed. Another interesting feature of this plant was its low initial cost as it was built almost entirely of used and locally-made equipment.

The writer recently again visited this plant and found that it had been much enlarged and improved in the intervening years. It's capacity is now 550 barrels daily, and its efficiency and quality control have been substantially improved. The improvement of the original operations was begun almost as soon as the plant went into operation and even now work is always going on in some part of the plant. The main product is still standard Portland cement although high-early-strength and Type II cements are also being produced.

This plant has been experiencing a growing amount of business from a territory which is roughly within a 200 mile radius. Almost all this business has been confined to retail dealer channels and relatively small contracts in connection with state-highway projects in Idaho and Washington, one of the largest single orders being for 19,000 barrels for the Lewiston-Clarkston Interstate Bridge which was built in 1939. Production figures show considerable increase in demand for the company's products. In 1935, the initial production year, the total was only 6,000 barrels for approximately 4 months. Figures for the succeeding years were: 20,000 barrels in 1936; 60,000 barrels in 1937; 91,000 barrels in 1938, with an expected levelling off of production for 1939 and 1940.

The quarrying and crushing departments were first improved during the winter of 1936-37. A drag-scraper, operated electrically, replaced the original ¾-cubic yard Diesel shovel and trucks in the quarry at the plant. The deposit contains a mixture of limestone, altered siliceous rock, and mica schist. The scraper now discharges this material directly into a hopper from which a shaker feeder passes it to a vibrating scalping screen. The dirt passing through this screen is wasted and the rock passing over it is discharged into a 15- by 36-inch Universal jaw crusher. A 24-inch belt-conveyor carries the primary crushed rock to a wood-and-concrete secondary crushing building, which department was originally equipped with a 36-inch Telesmith cone crusher for secondary reduction. In 1938 the original secondary crusher



The Killins plant as viewed from the scale-house.

was replaced by a Williams NF-40 hammer-mill.

In the summer of 1937 an additional quarry was opened at Jordan, 3 miles east of Orofino, to provide a high-calcium lime rock, in order to utilize more economically all materials coming from the Orofino deposit. The Jordan rock is a highly-crystallized limestone running consistently from 96 to 98 per cent. calcium carbonate, and is handled, after shooting, by means of an electrically-driven drag-scraper. The scraper delivers the rock to a shaker scalping screen, which feeds a 15- by 36-inch jaw crusher. The crushed rock is delivered from the crusher to a tram-loading bunker by belt-conveyor from which it is transported on a 900-foot tramway down a mountain side to loading bins at railroad level. Trucks haul the crushed stone to the plant where it is discharged into the secondary-crusher bins. The Jordan stone forms from 50-75 per cent. of the raw-mix composition, depending upon the clay content of low grades, which varies at different seasons of the year. Some sugar rock has been shipped from the Jordan quarry by railway.

View showing conveyor, secondary-crusher bin and building.

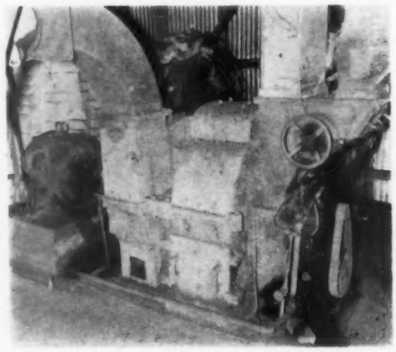
New changes in progress at the Jordan quarry include a completed 2,600-foot road from the quarry level to rail grade which removes the necessity for tram operations on future production. Two rock bunkers of 2,000 tons capacity for crushed limestone have been completed at the previous quarry level. A new screening and crushing plant is now being installed at a higher level above the new bunkers, incorporating the use of a 15- by 36-inch jaw-crusher, and a 4½- by 23-foot rotary screen for producing four separate sizings in limestone. Operation of this new installation is expected to begin by September 1.

Late in 1938 five reinforced-concrete slurry-storage and blending silos were built, each 15 feet in diameter and 30 feet high. They are equipped for both mechanical and air agitation and replaced the original steel tanks previously used for slurry storage. Centrifugal pumps feed the slurry from the raw mill to the concrete blending silos, where mix-control is maintained within 1/10 of 1 per cent. Slurry is fed to the kiln by a 2-inch Kimball-Krogh pump. the original 4½- by 20-foot raw-grinding mill has been retained and a second mill of the same size has been added to the raw department.

These improvements have resulted in many benefits, among which is finer slurry which is important where a short kiln is used. The cone bottoms of the new slurry tanks eliminates the former chore of cleaning out the old tanks once each month. The slurry is likewise handled satisfactorily at a moisture content of 33 per cent. as compared to the previous 35 per cent.

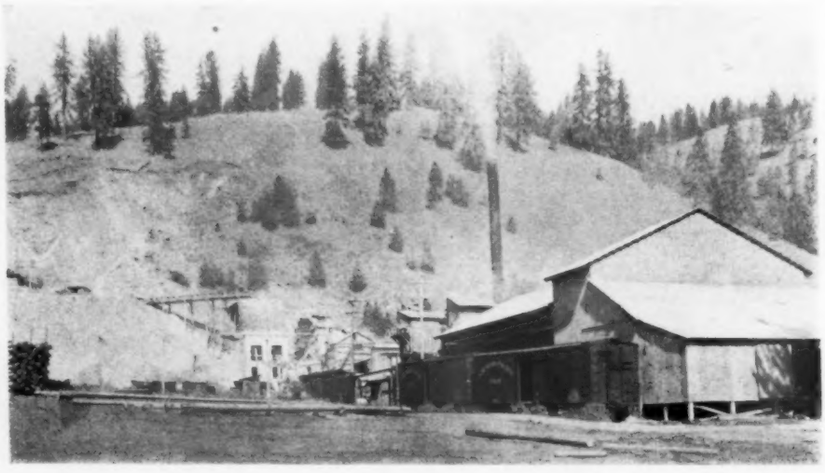
The 7½- by 125-foot kiln has not been changed but it is planned to double its length. This is expected to increase capacity about 75 barrels daily and to effect a coal saving of 30 pounds from the present consumption of 130 pounds of 12,500-B.T.U. coal per barrel. The coal is being ground by the original No. 50 Imp mill which is operated as a direct-firing unit.

The original 4- by 30-foot rotary cooler was replaced in 1937 by a 5½- by 35-foot cooler located in a concrete pit. The new cooler, through recovery of sensible heat in the cooling clinker, has effected fuel savings on burning operations of approximately 20 pounds of coal per barrel produced, and provides a cooled clinker of approximately 200 degrees F., making immediate grinding feasible.



Mill which grinds coal for the kiln.

A 24-VD Multiclone dust-collector was installed in series with the kiln stack during the winter of 1940-41, which unit is operated in conjunction with a 50,000-c.f.m. Buffalo fan. The entire dust-collection equipment is designed for substantial increase in capacity, in order to provide for the contemplated improvements in kiln operations. Dust-collection efficiency with the system as operated provides recoveries of approximately 92 per cent. of plus-30-micron sizes. Recovered kiln-stack dust is discharged into a centrifugal mixer of plant design, where the dust is in-



Another plant view with hillside quarry visible.

termixed with the slurry feed and returned to the kiln.

Preliminary clinker grinding is done by a 6- by 10-foot ball-mill operated in closed circuit with a Tyler-Hummer screen. This equipment replaced the roll-crusher formerly used for preliminary grinding. Finish grinding is done by the original 4½- by 20-foot tube-mill which is spray-cooled. Six-inch fans have been installed on the feed ends of both mills. These are not large enough to "air-sweep" the mills but keep the steam moving through them rapidly enough to prevent condensation on the discharge heads and to keep the grinding balls from becoming coated. These

Tractor and bulldozer cleaning up around the plant.

improvements have made much finer grinding possible, and have materially increased cement production. Standard Portland cement is now being ground to a fineness of 93 per cent. through a 200-mesh sieve and to a specific-surface area of 1,700 square centimeters per gram at the rate of 600 barrels per day.

The original gypsum department has been radically changed. Use is now made of a Hardinge automatic-weighing feeder, which is electrically interlocked with the clinker feeder so that variations in feed rates are synchronized. A 15- by 30-foot steel-and-concrete feed bin stores and delivers the gypsum to the weighing feeder.

A 22,000-barrel cement stock-house has been added, which includes storage for standard and high early cement. Two 3-spout Bates packers are now used in the pack-house, the second packing machine and feed bin having been added to handle the high-early-strength cement. Dust-collection equipment has also been installed in the pack-house.

The progressive improvement program carried forward by this company has shown remarkable increases in production efficiencies as seen by the comparative capacities experienced originally and at the present time.

An interesting sidelight is the difference in the weather at Orofino and Lewiston, which is 44 miles west in the same valley but at a lower elevation. Lewiston has winter temperatures of 20 to 25 degrees above zero. In Orofino a minimum of 15 to 25 degrees below zero is not uncommon.

New Hampshire Possesses Extensive Mica Reserves

The mica deposits of western New Hampshire have been examined by J. C. Olson, geologist of the Geological Survey, United States Department of the Interior, as a part of the Survey's investigation of domestic sources of strategic minerals. High-grade sheet mica is regarded as a strategic mineral because it is widely used in radios, spark plugs, airplane motors, and other electrical equipment and has been obtained in the past mainly from foreign sources, principally India. The cheapness of labor at these foreign mines gives them a great advantage, for much hand labor is required in preparing mica for the market.

The sheet mica occurs in blocky crystals, called books, distributed in large pegmatite bodies. In the best mines the books are localized in zones or streaks. The limits of these zones can not be predicted in advance of mining; reserves of individual deposits therefore cannot be estimated. The examination showed, however, that the region as a whole contains large reserves of sheet mica.

Since 1803, when the first commercial mica mining in the United States was started at the Ruggles mine, in Grafton County, these New Hampshire deposits have yielded a substantial part of the domestic production. An average of more than 400,000 pounds of sheet and punch mica was produced annually from 1908 to 1939. But for the past 10 years production has been below this average because imported mica has competed in the domestic market. Olson's examination covered 139 mines — practically all in the region. He estimated that the western New Hampshire deposits could supply annually for several years about 500,000 pounds of sheet and punch mica.

Tests made by the National Bureau of Standards on samples of carefully selected sheet mica from New Hampshire indicate that it meets the exacting specifications established for mica used in some types of equipment.

16 Sizes of Material from One Plant

By F. L. SPANGLER, M.E.

TWELVE different sizes of gravel, as well as masons' sand, concrete sand, pea gravel, and buckshot, or a total of 16 sizes of material are offered by the Western Indiana Gravel Company, Anderson, Indiana, to its customers. The screening-and-washing plant has 10 gates from which trucks can be loaded to carry the material to storage or to the point of use.

The gravel pit is about a mile and a half from the crushing and screening plant. The material is loaded into three General Motors trucks having a capacity of about 4 cubic yards each. The loading is done with a Marion gasoline drag-line having a capacity of 125 cubic yards per hour.

At the crushing plant the trucks dump the material through a grating into a hopper, whence it passes through a Champion jaw crusher and is fed to a 24-inch belt, which carries it to a 6-inch McCully gyratory crusher and a 2-foot Symonds cone crusher.

The material then drops on another 24-inch belt, which transports it to the screening-and-washing plant. The sand screen is a 4- by 8-foot, 3-deck Niagara; the gravel screen a 3- by 8-foot, 2-deck Niagara; and the scalping screen a 4- by 10-foot, 2-deck Gyroset.

A 1½-ton Ford truck carries the material to storage. The truck is loaded at each of the various gates and dumps its load alongside the proper storage pile, where it is picked up and dumped on the pile by means of a Marion gasoline drag-line similar to that used in the material pit. A Barber-Greene loader and the Marion drag-line are both used for loading from storage.

An important item of maintenance expense on these drag-lines is rope replacement. This company has reduced this to a low figure by using preformed rope, says J. A. Reilly, superintendent of the Anderson plant. Both these drag-lines are in almost continuous operation. Lang-lay preformed rope, with independent wire-rope center, is used for both the drag and hoist lines on these machines. The ¾-inch drag cable lasts an average of about two weeks, and the ⅜-inch hoist cable is replaced about once a month. When non-preformed cables were used, they were replaced twice as frequently. The preformed rope not only has proved a good investment from the standpoint of the cost of rope renewal, but it has meant fewer shutdowns for cable replacement, thereby contributing to increased output.

Old quarry and cave entrance.

The "totem pole."

The crystal waterfall.

The CAVE of

By P. C. ZIEMKE

MOST quarries are destined to suffer the ignominious fate of being deserted when their exploitation has been accomplished and are then utilized as public dumps or more or less hazardous swimming pools. There are the exceptions, of course, where city planners landscape the area and thereby develop fine parks and recreational sites. However, Mother Nature has stolen a march on the situation as it were by suddenly transforming a quarry into a thing of rare beauty.

Cave of the Mounds was discovered August 4, 1939 during regular blasting operations at C. I. Brigham's quarry located on the farm of the same name, the oldest farm in Dane County, Wisconsin. The quarry dates back some 39 years and has experienced fairly active operation during the intervening years in serving the adjacent locality with limestone. Practically every type and style of drilling equipment has been used there, as have also the various grades and brands of explosives ranging from the old-time "straight" powders and black "stumping" to the modern gelatines and bulk or bag powders.

Recently jack-hammers had been discarded for blast-hole drill equipment in competition with the prevailing trend in blasting practice to produce stone on a large scale for the highway commission of Dane County. In August the drill rig had put down 8 6-inch holes which were loaded with 200 pounds of bag powder per hole. The resulting blast tore out the side and roof of a hitherto unsuspected natural cave and brought the hidden glories of Nature to the view of the astonished blasters.

A subsequent investigation of the cave's possibilities by experienced geologists resulted in a decision by the quarry owners to abandon further quarrying and to develop the cave's natural beauties and its commercial value as Wisconsin's only large natural cave.

C. P. Brechler and F. H. Hanneman leased the site from Mr. Brigham and secured the services of Alonzo W. Pond, a lecturer and writer on natural-science subjects to act as promoter and manager. Under his supervision the beautiful stalactites and stalagmites and the numerous other subterranean treasures were artistically lighted by electric

the MOUNDS

"spots" of great brilliance and clever arrangement.

To-day courteous guides, duly coached and instructed by the painstaking Mr. Pond on every scenic feature of the cave, lead the visitor over well-constructed plank walks and stairs to view and exclaim over the beauties hidden from sight for millions of years. The face of the quarry has been carefully scaled down to prevent the falling of rock and a rustic fence constructed to conceal the *débris* lying along the base of the horseshoe-shaped walls. Adze-hewn timbers, cut in the nearby forest, are used to support the roof of the cave that originally was structurally strong but suffered damage from the final blast. The same type of timbers are used for roof beams for the office and waiting rooms located at the entrance of the cave. The outer walls of this building are constructed of the quarry's stone.

Visitors unaccustomed to underground workings, are astonished at finding themselves in a decidedly cool atmosphere, since the air registers 46 degrees F. during the hottest of summer days. Immediately inside the entrance the guide asks the group of visitors to view the fossilized body of a cephalopod securely incased in the solid stone of the cavern's ceiling. From this point one may also view the largest straight section of the cave extending from north to south for 250 feet.

Here are to be found numerous fine examples of beautiful underground architecture. Curious shapes in crystal-clear limestone greet the eye at every turn for this new find is a treasure chest of subterranean art where almost every conceivable shape and pattern known to science can be found. Here is the crystal waterfall, its seemingly limpid waters transformed to perpetual stone of exquisite beauty and charm. Great onyx pillars of joined stalactites and stalagmites support the vaulted roof in places where once flowed water heavily charged with lime and other soluble minerals.

Along the railed walks one sees the tiny underground lakes of solid stone with their almost lifelike lily pads "floating" on the marble surface. In other spots are "bleeding" stalactites whose veins of realistic red are due to the frequent, though minute, traces of iron oxide scattered about in the limestone formation. There are rare specimens of ribboned stone resplendent in con-

(Continued on page 56)

Fairy grotto and "marble river."

Theater of the gods.

Chapel and altar niche.

Hints for Operators of Small Suction Dredges

By HENRY LOCKHART, Cleghorn Corporation

Several years' experience operating a 6-inch suction dredge have resulted in the discovery of information which may be useful to other operators. First, a word to readers who have not yet started in the gravel business. It hardly seems necessary to mention it, but many producers start without a thorough survey and analysis of the deposit. The amount of overburden to be stripped, the percentage of sand and gravel, and its suitability as regards sizing and the presence of impurities and hard strata of clay, etc., must, of course, all be considered.

Second, in laying out the plant, remember that the height to which you have to pump is an important factor. Try to keep the head down, as about twice as much power is needed to elevate to, say, 35 to 40 feet as nearer water level. This requires more power, means more expense, and, worst of all, you will have considerable difficulty settling the amount of fines now being required for state and federal work. Most sand-settling tanks were suitable for settling the amount of fines required up to last year. But the new requirements specify over three times as much minus 50-mesh sand on an average and this is an important consideration.

In our experience, for instance, we found that instead of one settling tank, of a certain size, which we were told would be sufficient, we finally had to install three. It was also necessary to put in extra baffles and level the feed line (trough) as much as practicable (without frequent overflowing) before we could retain the required fines.

These tanks were installed parallel and not in series. However, if there is a call for coarse and fine sand, separate troughs can be arranged so that the tanks can be operated in series as needed. It also should be mentioned that additional equipment, such as a classifier, may be necessary in the line to eliminate intermediate sizes which exceed the requirements, or a crusher to make up a deficiency in fines from pea gravel or other sizes.

The above equipment may be found too expensive for some, and it must be remembered that the material must be elevated to some height where settling tanks are used, adding to the difficulties. For their benefit I might mention two plants I have seen which are apparently producing a clean sand and retaining the fines. The gravel was first screened out at a low elevation and the sand and water run into a large square compartment which was at ground level and looked very much like a cellar. This compartment or settling box is walled in with cement blocks and, or, concrete (6 or 8 inches thick). It has to be watertight, of course. The overflow of water is taken care of by placing boards at the overflow points at one end, building them up as the sand is deposited, the water being run through drains back to the pond. The sand must then be taken out by a power shovel or a removable door can be provided so a dump truck can back into it. Two compartments used alternately provide for continuous operation.

In our dredge operation for hoisting and lowering the suction pipe we used a power winch taken from an oyster dredge boat and operated from a jack shaft by our engine, as there was power to spare. We found that for hard bottom we got more suction by replacing our standard hood by a nipple. A bolt was placed across the end of the nipple to exclude large stones. A nipple with a hand-hole plate next the pump for extracting stones wedged in the impeller was found to cost considerable, so a flanged T was used, a plate for it being made locally from a flange. Another T, with a gate valve and pipe extending over the side, was placed just inside the valve on the pressure line. This allows the line on the dredge to be cleared when loaded very often without taking everything apart. Another T with a valve is placed at the bottom of the stationary line so that this section can be cleared quickly.

With the fuel tank on the dredge we found considerable difficulty when the fuel truck was unable to reach it—trouble in disconnecting the line and moving. So the tank was placed on a float which can be cut loose and pulled ashore. This also reduced the fire hazard.

A stoppage in the pressure line doesn't happen often but it is hard to locate. I found that almost half a day had been spent trying to locate one by grappling for it with a hook, yet it was located in a few minutes by disconnecting the line in three places and using a flashlight. A hammer then shook loose the stone which was wedged in the stationary line.

If the trouble seems to be in the suction line, attach a pitcher pump to the pump after priming the line. If the pitcher pump fails to get water there is either a leak or a stoppage. Leaks can be detected by ear or by holding a lighted match over connections. Stoppages, of course, are more troublesome, but can often be dislodged by cleaning and priming the pump and pressure line and then starting the pump. This will often clear the line without taking it apart.

We also placed a large elbow fitted with rubber sleeves between our shore and pontoon lines. This allowed enough flexibility to keep the shore pipe from being bent as the dredge moved back and forth. It is hardly necessary to add that all pipes and fittings should be turned occasionally—fittings such as valves, end for end—so that the wear will be uniform.

A jet spray on a bank that does not cave easily also helps. Another item promoting efficiency when short handed is a tell-tale device—which can be "home made"—to show how much gravel is running out, or when a gate has jammed on a settling tank. If water under the tank discharges is a difficulty and the drains fill up, siphons can be used. Several small ones are preferable to a large one as the latter will carry off some fines.

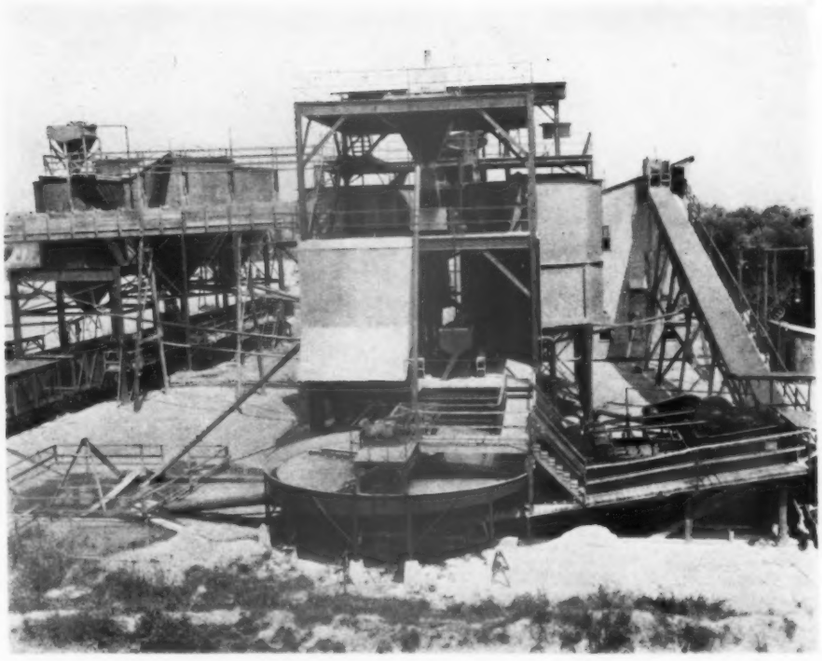
I may add a final word about retaining fines in the sand. Remember first of all to reduce the speed of the pump when having difficulty. Then check by test—settling the sand in a bottle—how many fines are going out in the dirty water. We ran our dirty water into an old sand bin, which was first made water tight, to settle the fines we were losing. This amounted to several tons a day. We were able to increase our percentage of minus 50-mesh from about 5 per cent. average to 11 to 12 per cent. by adjustments such as those described.

Caverns (from page 55)

trasting shades of jet black and crystal white, truly fitting material of which to build an altar.

Manager Pond has endowed these natural sculptural masterpieces with fitting names and titles, some of them perhaps a bit grandiose and presumptive yet entirely within the bounds of a showman's ethics. Actually more than a hundred distinct types of cave formations are found in the section of the cavern now developed for public viewing.

That the newly discovered cave is popular is attested to by the fact that approximately 60,000 persons have paid admission to see the state's newest and largest cave during the comparatively few months since its opening.



LEFT—This view of the plant shows the turret-bowl classifier, rake and sizer in the foreground.

New Phosphate-Recovery Methods Make Reprocessing of Waste Profitable

THE technique of recovering phosphate from pebble deposits in Florida has made such strides in recent years that the reprocessing of old waste piles has become profitable. Several reprocessing plants using flotation methods are now in operation. One of these is operated by the American Agricultural Chemical Company at Alderman Station, 7 miles south of Plant City, Florida. This plant, known as Number 1, went into operation in February, 1940 and is reworking the waste from an old washer which was moved away in 1933. An average of 80 tons of raw material per hour is fed to the plant which extracts an average of 32 tons per hour of finished high-grade concentrate. The bone-phosphate of lime recovery averages from 85 to 90 per cent. of the content of the plant feed.

The American Agricultural Chemical Company has been operating exclusively in the Florida pebble-phosphate fields for many years. Its drying plant and storage and shipping facilities are located at Pierce, which is about 15 miles south of Lakeland. At present two washing and two recovery plants are operated. The Carmichael No. 2 washer and recovery plants, built in 1933 and 1934 respectively, are located about 20 miles southwest of Lakeland. The Number 10 washer is at South Pierce and the Number 1 recovery plant is at Alderman Station, not far from the Number 2 washer. This is the only reclaiming plant operated by the company. All the other plants are working on virgin deposits.

The source of supply for this plant consists of old cuts averaging 30 feet in depth. The same hydraulic method employed on virgin deposits is used, but less water pressure is required. Hydraulicking is done with giants or nozzles having 1½-inch tips, 6-inch lines supplying water at 60-pound nozzle pressure. The "soup" is picked up by an 8-inch Georgia Iron Works centrifugal pump and is transported a distance of from 200 to 2,000 feet and lifted 80 feet to the reprocessing plant. Under ideal conditions 640 long tons of material can be pumped to the plant in 5 hours.

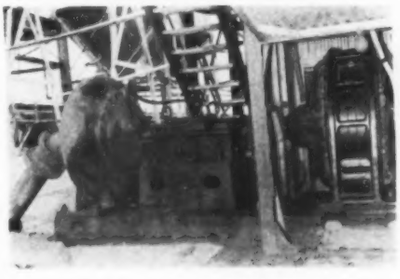
A breaker box receives the pipe-line discharge which is then dropped on a 4- by 10-foot Robins Vibrex 1-deck screen fitted with ⅜-inch wire cloth. The oversize, which has a high iron content, is wasted through a flume. The material passing through the screen drops into four 20- by 20-foot cylindrical steel bins with conical bottoms. Rubber pinch valves control the discharge of this slip from these bins into a tank-type scrubber. The material overflowing this scrubber goes into a steel sump feeding a 6-inch Georgia centrifugal pump, which has a screwed-on impeller and discharges the slip into an 8-foot Allen cone on top of the plant. This makes a rough separation of the material at 48-mesh. The minus 48 mesh overflow goes direct to a Dorr turret-bowl classifier.

The 48-mesh to ⅜-inch material discharged from the bottom of the cone goes to a 4- by 8-foot Robins Vibrex screen with 5/16-inch cloth. The 5/16- to ⅜-inch material passing over the screen goes into a sump

The 48-mesh to 5/16-inch material falling through the screen is split to two rows of six pocket Dorr Fahrenwald sizers. The minus 28-mesh underflow from the three cells of each sizer goes to the Dorr classifier. The 28-mesh to 5/16-inch underflow from the other three cells of each sizer goes to the sump already mentioned. A 4-inch Georgia pump feeds the material from the sump into an Allen cone for dewatering before it is discharged into a 15- by 15-foot circular steel tank for loading into cars as a medium grade finished concentrate.

The product of the rake classifier is discharged on a 24-inch by 150-foot belt-conveyor on the top of the flota-

Vertical conditioners in which froth-flotation reagents are added.



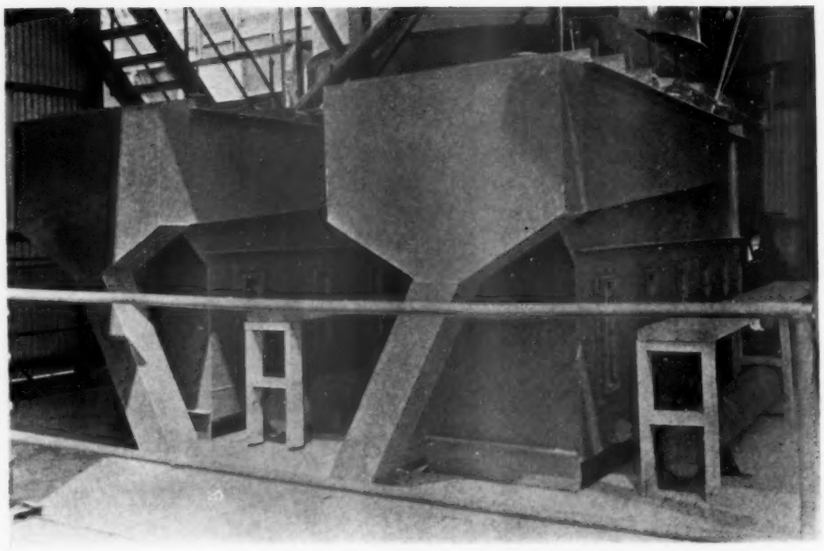
The 10-inch pump which handles debris to waste.

tion building. There the material is discharged through a chute into a series of four conditioners where reagents are added. These consist of caustic soda, fatty acid and a mixture of fuel oil and distillate. The mixture is discharged from the last conditioner into four 56-inch Fagergren Type SS rougher cells arranged in two rows.

The concentrated product from the first two cells in each row is discharged into a concentrate sump. The concentrate from the last two pairs of cells is discharged into two cleaner or finishing cells and thence into the same sump. The tailings from the fourth cell in each row flow to an 8-inch Allen-Sherman-Hoff Hydroseal Maximix rubber-lined pump which discharges it through a pipe-line to a tailings dam.

The waste material from the two finishing cells goes to a middlings sump and a 4-inch Georgia pump returns it to the first two rougher cells.

The 8-inch pump which carries flotation-cell tailings to waste.



End view of the two 6-compartment sizers.

Cone which dewaters the 72½-grade material before it goes into the loading bins.

Looking down on the rougher cells in the flotation building.

The high-grade concentrate is fed from the sump to a 4-inch Georgia pump which discharges it into two 500-ton cylindrical steel bins with conical bottoms and from thence it is loaded into cars through a bottom-discharge gate and two side spouts on each bin. All the bins are equipped with sliding gates which are screwed up tight when not in use to prevent loss through leakage. Both products are shipped separately over the Seaboard Railway to the drying plant at Pierce, 13 miles away.

Screen which removes oversize from feed to plant.

All the waste from this plant goes to a settling pond in a worked-out section of the pit. A Worthington deep-well pump brings fresh water from a depth of 900 feet and this goes to a sump. About half of the waste water is used again and this also goes to the sump. A 6- by 7-inch Morris pump supplies water to the flotation cells. A 4,000-gallon-per-minute Allis-Chalmers centrifugal pump feeds water from the sump to the Fahrenwald sizers, to the hydraulicking nozzles, etc. Taylor spiral welded pipe is used on most of the water pipelines.

Price-Fixing and the Anti-Trust Laws*

Part I—Direct Price-Fixing Activities—Manufacturers' Groups

By GEO. H. SAGE

Scott, MacLeish & Sage

A—Control of Manufacturer Prices

The activities of price-fixing groups have become extremely important in modern business. In innumerable industries price-fixing groups have arisen at one period or another and have seized or attempted to seize control of their respective industries. Formed at every stage of economic endeavor, the groups include manufacturers, distributors, contractors, the service trades, the professions, labor, and agricultural coöperatives. Groups have even entered into price-fixing combinations with other groups. Price-fixing activities, moreover, have embraced not only the price policies of their members but also the price policies of non-members in the same stage of an economic process as well as the price policies of enterprises at other stages, a manufacturer group, for example, controlling the policies of individual distributors, or a distributor group controlling the policies of individual manufacturers. Whether a business enterprise be engaged in a selling capacity or in a purchasing capacity, whether it engage in the sale or purchase of consumer goods or of industrial goods, or whether it be a manufacturer, a dealer or industrial purchaser, a contractor, or a service trade, the enterprise may be vitally concerned with the activities of a price-fixing group; if not as a participant, then as an object.

Price-fixing activities may vary considerably in form, scope, and complexity. The activities may be direct or indirect. They may apply to prices, terms and conditions of sale, or channels of distribution. They may range from relatively simple agreements to fix prices to relatively complex basing-point pricing systems or patent license set-ups. The organizational structure may consist of combinations of independent enterprises informally joined, of trade associations of independent enterprises more formally combined, or of industrial mergers or consolidations of independent enterprises formally integrated into a single large, predominating enterprise. Embracing the whole range of industry set-ups, policies and practices, price-fixing activities may assume many shapes, follow many paths, employ many devices.

Manufacturers as Sellers

Manufacturer groups may engage in direct price-fixing activities in their capacity as sellers, as purchasers, or as both sellers and purchasers. Considering, first, only their activities as sellers, the motivating force may, on the one hand, be the avoidance of further "ruinous" or chaotic price competition among the manufacturers in a particular industry. "Ruinous" price competition in the industry may have already resulted from a "price war," raging for an extended period of time; from a chronic economic condition of excess production capacity, drastic decline in demand, increasing competition from substitute products and the like, characterizing a "sick" industry (illustrated by the case of the bituminous-coal industry); or from the occurrence of a depression period, with its accompanying decline in demand and excess production capacity. In consequence of the "price war," chronic economic conditions, or a depression period prices for the products of the various manufacturers may have fallen precipitously, even to levels below cost, bringing in their downward spiral fall tremendous financial losses to the various manufacturers, if not impending ruin. To avoid further continuance of this situation the manufacturers in the industry may combine to eliminate price competition among themselves and to "stabilize" prices for their products, the prices to be fixed intended only to be "reasonable" in amount.

The motivating force may, on the other hand, be purely "monopolistic" in nature. Manufacturers, in the absence of agreement or other restraint, ordinarily may compete on a price basis in the making of sales. Competition on a price basis under the ordinary operation of economic forces, however, generally causes prices to fall to or remain at a lower level than may occur in the absence of price competition. To establish and maintain prices at a level higher than that resulting from unrestricted price competition, with the consequent higher profits, the manufacturers may enter into a price-fixing combination, the prices to be fixed intended, therefore, to be "monopolistically" high.

Whatever the motivating force, manufacturers may enter into a group or combination to fix and maintain identical and uniform prices. The group or combination may range in form from the most informal telephone exchange of price information between two competitors only or the most informal discussion or meeting of competitor manufacturers in the traditional smoke-filled hotel room behind locked doors to a formal organization of practically all the manufacturers in the industry. A formal organization is illustrated by a central committee of representatives of the manufacturers appointed proportionate to plant capacity, in whom is vested the power to determine, among other things, the uniform prices to be charged by all the manufacturers in the group, who otherwise retain independent ownership and operation of their plants. The relatively small number of manufacturers in the industry, resulting perhaps from economic concentration in the past, may facilitate the creation and maintenance of this price-fixing group.

The prices fixed may be minimum, specified, or differential prices. Where the group fixes only minimum prices, each manufacturer in the group is required to sell at prices not less than this minimum, not being otherwise restricted from selling at prices above the minimum. In operation, however, the actual prices, under the influence of the remaining competitive urge on the part of individual manufacturers, generally tend toward the level of the minimum prices, so that minimum prices in practical effect become specified prices. Instead of fixing merely minimum prices the group may in fact fix specified prices or identical and uniform prices to be charged by each manufacturer in the group, these prices taking the form either of list prices subject to uniform discount rates or of net prices. Less commonly, especially where very few manufacturers belong to the group, the prices fixed by it may consist of specified prices which are subject to differentials per unit of product between the manufacturers, reflecting differences between the manufacturers in their relative importance in the industry.

Manufacturers as Purchasers

In addition to being sellers of goods, manufacturers are also purchasers of raw materials or supplies for manufacturing, processing or refining purposes. In many industries the manufacturers may indeed be substantial purchasers, depending, at least in large part, on such

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purchases for the necessary raw materials or supplies to keep their plants functioning. By way of illustration, meat packers purchase large quantities of live stock at the various stock yards; gasoline refiners, crude oil at the various "spot" gasoline markets; tobacco products manufacturers, tobacco leaf at the various auction warehouses; and milk distributors, raw milk from the numerous individual farmers or farmer co-operative marketing associations; some cement manufacturers purchase crushed stone or gypsum; ready-mixed-concrete manufacturers purchase cement and aggregates. Not only natural raw materials, as indicated, may be purchased in large quantities by manufacturers but also industrial raw materials, such as waste paper for the manufacture of paper products, containers or scrap iron for the production of steel, cement for the making of concrete products.

In their capacity as purchasers as distinguished from their capacity as sellers, manufacturers may, therefore, engage in price-fixing activities. Where the manufacturers in a particular industry are relatively few in number while the suppliers are relatively great in number, or where a few large manufacturers in the industry control the major portion of the industry's output, the manufacturer group may acquire sufficient economic power to enable it to adopt a monopolistic price-fixing policy. In the milk-distribution industry, for example, a few large distributors in metropolitan areas, because of their large investment, organization, and advertising, may have secured effective control of the business of distributing milk in the area as compared with the larger number of smaller independent distributors, thus possessing great economic power with respect to the large number of individual milk producers. Seeking to reduce to the manufacturers in the group the cost of their essential raw materials or supplies, the manufacturer group may fix the prices, either specified or maximum, to be paid to suppliers. Even where sales transactions in the commodities in question may actually be completed in open-market bidding, such as in the case of live stock or tobacco leaf, the manufacturer group may readily fix the amount of the uniform and identical bids, or at least the maximum amount of the individual bids, which the manufacturers are required to make. The prices so fixed will naturally be forced down to, or kept down at, a "monopolistically" low level in that the prices fixed will be lower than the level of prices would be in the absence of any such restrictions upon the price competition that would otherwise result.

Manufacturers as Sellers and Purchasers

This dual capacity of manufacturers as both sellers and purchasers may even lead the manufacturers in an industry through the same group to enter into a double-acting price-fixing combination, in effect two price-fixing combinations—one to fix the prices of the products they sell; the other to fix the prices of the raw materials or supplies they purchase. While "ruinous" price competition or mere "monopolistic" profiting may dictate a combination to fix the sale prices of products, a similar underlying motive may dictate a combination to fix the purchase prices of the necessary raw materials or supplies. The same predominant economic power in the manufacturing group enabling the group to fix sales prices may enable it to fix purchase prices. The manufacturer group may therefore fix the prices of both the raw materials or supplies which its members purchase and the finished products they sell.

By way of illustration, in the milk-distribution industry a few large milk distributors may fix both the prices of raw milk paid to the farmers and the prices of the pasteurized milk charged to their customers; in the tobacco-products manufacturing industry a few large tobacco manufacturers may fix the prices of tobacco leaf paid to the growers and the prices of tobacco products charged to their customers; in the meat-packing industry a few large meat packers may fix the prices of livestock paid to the stock raisers and the prices of meat charged to their customers.

Although a manufacturer group may thus fix sale prices, purchase prices, or both sale and purchase prices, and although each manufacturer in the group may thus agree to observe the prices fixed, individual manufacturers in the group itself may threaten the price structure created by the group. A desire to avoid "ruinous" price competition or perhaps a desire to secure "monopolistic" prices may have impelled individual manufacturers to enter into the price-fixing group, but a desire to achieve individual advantage at the expense of the other manufacturers in the group may still remain. Impelled by this remaining competitive urge, individual manufacturers in the group may directly or indirectly, as through the granting of secret rebates, sell below the minimum or specified prices fixed by the group. Even where the individual manufacturers themselves may intend to adhere strictly to the prices fixed by the group, their sales representatives in a desire to make a good sales showing may on their own initiative directly or indirectly, as through splitting commissions, sell at prices below the minimum or specified prices fixed by the group. Price-cutting on the part of individual manufacturers in a group, at first perhaps as isolated instances or confined to only a few manufacturers in a group, may readily tend to become extensive in scope when practiced by many of the individual manufacturers, and, apart from a loss of business suffered by the other manufacturers in a group, the increasingly widespread price-cutting may undermine the whole price structure erected by the group.

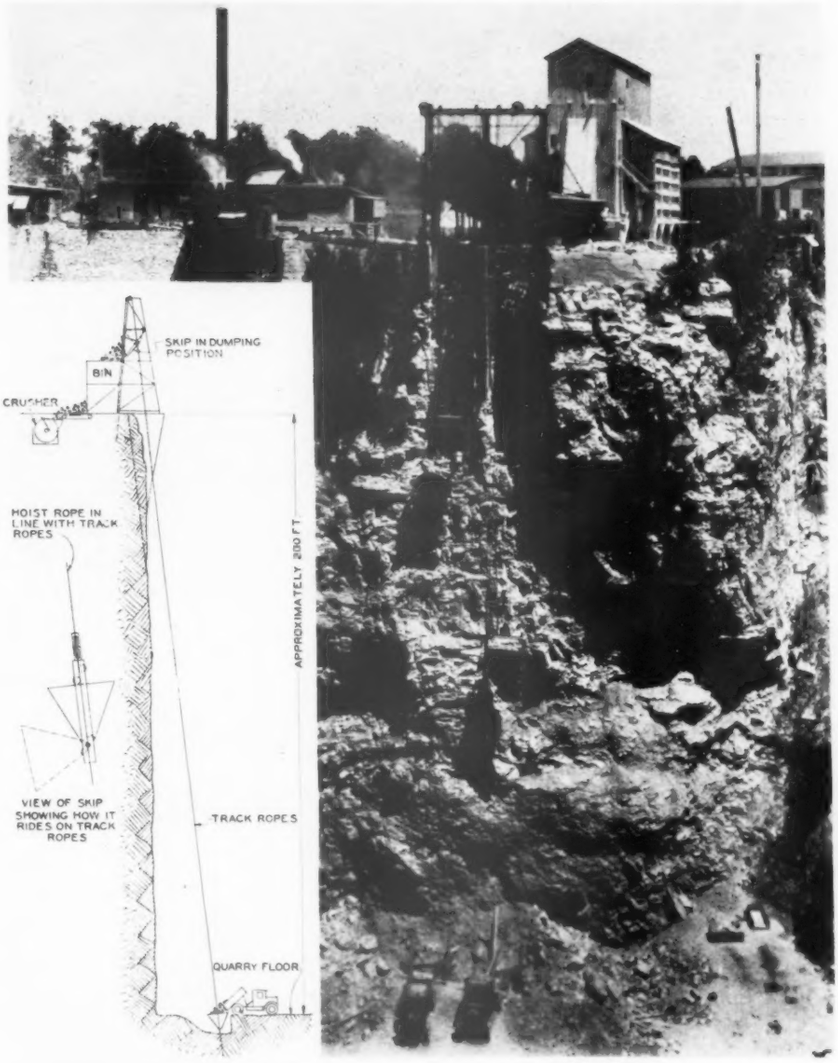
Price Enforcement

To combat this serious threat to the efficacy, if not existence, of its price-fixing program, the manufacturer group may adopt punitive or preventive measures, ranging from the imposition of financial penalties to active policing of the industry. Each manufacturer in the group, as part of the agreement among the manufacturers, may deposit money or financial security with a central agency to insure full performance of its obligations, or may agree to pay certain stated penalties or any penalties imposed by the group for infractions. In case of deviations from the prices fixed by the group, the individual manufacturer may then forfeit the money or financial security deposited.

In place of this financial deterrent, or perhaps even in addition to it, a group may set up a system of active policing of the industry, which may vary greatly in details. For illustration, one system of policing consists of the furnishing, to a central agency by each manufacturer in the group, of copies of the invoices of all shipments, specifying quantities and prices; of periodical sworn statements of all shipments, specifying names of purchasers, character of the goods sold, and prices of sale; or the account books of each manufacturer may be audited by the central agency for the purpose of detecting price deviations or checking reports of price deviations.

However strong the terms of the price-fixing scheme among the manufacturers in a group, whether sellers or purchasers or both, the effectiveness of the scheme may depend upon a practically complete control of the industry by the group. One or more large manufacturers, or several smaller manufacturers, controlling a not inconsiderable portion of the industry in terms of plant capacity or sales or purchase volume, if remaining outside the manufacturer group, may well cut prices below those fixed by the manufacturer group for sales or raise prices

(Continued on page 65)



Sketch and photo of the skip and rope-track installation.

Reciprocating Skip-Hoist Rides Wire-Rope Tracks Instead of Rigid Rails

By K. MIKKELSON, Superintendent, Big Bend Quarry Co.

SOME six or seven years ago we decided to change most of our quarrying operations from open-pit to tunnel excavation though much of our dry-weather operations are still in the outside pit. The quarry is more nearly oval than circular in shape, with a maximum dimension across of between 600 and 700 feet, and a depth of about 190 feet. Our first headings were driven into the south face of the quarry on a level with the quarry floor. A double-bucket skip hoist on the eastern side of the quarry pit conveys the rock up to the crusher at the edge of the quarry.

We decided on tunneling operations because many of our customers were specifying dry rock. Tunneling provides dry, clean rock at the source. In changing over to tunneling operations we had to determine how best to drive the drifts and headings to obtain the lowest cost with complete safety, and how to use our Koehring 1-A ¾-cubic yard shovel to get maximum production.

In this underground work our shovel is digging 550 to 700 tons a day, representing a considerably greater output than normal for a shovel of this size. Naturally such a high output can be obtained only at a considerable cost for cable renewals, but we have been able to keep our cable costs reasonably low by using preformed rope for both the crowding and hoist lines.

We attempt to maintain as many headings as possible so that the crews employed in drilling, blasting, and loading will not be in each other's way. The most satisfactory method we have found for driving a tunnel or a heading is with a step-cut face comprising a series of steps. Each step has a face from 10 to 16 feet high, and the height of the tunnel is generally about 70 feet.

To blast out 7 or 8 feet of rock for one of the steps, we put three charges into the face, these being arranged vertically with the middle charge the heaviest of the three. The middle charge is set off first, followed by the lighter top charge, and then the bottom charge. Most of our blasting powder is Atlas and Illinois, 40 per cent. and 60 per cent. strength.

As soon as practicable we start driving lateral headings from the main drift, and then other headings are driven from these branches, resulting in a network of drifts between which are pillars of rock that support the roof. As tunneling proceeds we inspect the roof very carefully and test it for soundness by means of a steel bar. When we find evidence of loose roof rock, either we bring it down by hand or blasting methods, or we leave a sufficiently large pillar of rock to give the needed support. We select the method that seems the most desirable from a safety standpoint.

After the drilling and blasting are completed at a face, the shovel is moved to the face for loading the rock

(Continued on page 63)

Dump truck discharging load to the bucket.

A view in the McCorkle quarry showing two of the skip-body trucks. Receded face of dolomitic stone visible above.

A general view of the crushing-and-screening plant. Skip-load of stone being lowered to crusher by derrick at right.

AGRICULTURAL STONE, CONCRETE BRICKS IMPORTANT PROFIT ITEMS FOR PRODUCER

AGRICULTURISTS have learned by study and sometimes bitter experience that soil constituents have great influence on the quantity and quality of the crops raised. When soil is worked and reworked continually Nature can not make the necessary replacements rapidly enough and man must supplement her efforts. Among the conservative measures playing a big *rôle* recently is the use of vast amounts of liming materials, especially agricultural stone, to build up the soil on farms. Hundreds of crushed-stone operators, large and small, have signed conditional contracts with the A.A.A. under its soil-conservation program.

Whereas once the accumulation of "nuisance dust" incidental to crushing and screening operations constituted almost the entire agstone output, these producers, in order to meet the increased demand, are adding pulverizing equipment to make an acceptable product. With many of them the production of agricultural stone now accounts for half or more of their total output.

Typical of these operators is the McCorkle Stone Company of Milroy, Indiana. Over 50 per cent. of the annual output is currently being ground and sold for agricultural purposes, private truckers purchasing the stone at the plant in most cases and re-selling it (and often spreading it as well) on farms within a 20-mile radius of Milroy.

The McCorkle deposit is lightly overlain with burden. An 8- to 10-foot band of buff-colored dolomitic limestone is first encountered and below this to a considerable depth is an extremely hard light-gray low-magnesia stone containing considerable chert and flint. The dolomitic stone is being used almost exclusively for agricultural purposes because of its higher value as a soil builder. A 27-foot face is being worked in the quarry this summer, the shallower face of agricultural stone having receded some distance away from the quarry proper because of the demand for this stone. Stocks of agricultural stone are largely built up in the winter and spring.

Brick machine with mixer and chute above.

Except for secondary breakage in the quarry, holed with Ingersoll-Rand Jackhamers, the drilling is let to a private well-drill contractor. Stone is loaded by hand into 1-cubic yard detachable skip bodies carried by three Chevrolet trucks to a timber-frame derrick which lifts the loaded skips out of the quarry and dumps them into the 9- by 36-inch Telsmith primary jaw-crusher at the plant—a vertical rise of about 50 feet with a 90-degree swing. The single-drum hoist which operates the derrick is controlled by the crusher tender.

The crushed material is carried by a 40-foot Telsmith bucket-elevator to the 3-deck Tyler-Niagara vibrating screen at the top of the plant which does all the sizing. The oversize is, however, first scalped off on the top deck and returned by a gravity chute to the secondary crusher—a No. 19 Kennedy gearless gyratory machine located at ground level. The product of this reduction machine is also fed to the 40-foot plant elevator and returns to the screen.

The three sizes of material separated by the screen are chuted to the 3-compartment loading bin below. The bin has a total capacity of 100 tons and, when agstone is being produced, a Stedman 20- by 18-inch Type A portable hammer-mill is wheeled under the bins and the larger-diameter stone is fed through the bin gates to the pulverizer to augment the supply of fines which pass the screen decks.

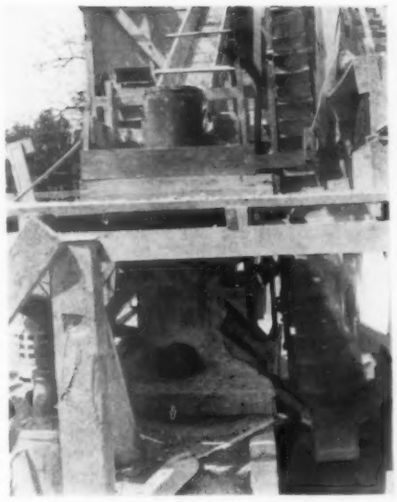
Production is normally at the rate of 20 tons per hour and about 17 tons hourly when making agstone. Sales of the agricultural product this year are estimated at about 12,000 tons. Shipments are weighed on a 15-ton Winslow truck scale installed this summer.

While all the dolomitic-stone fines are sold for agricultural purposes, the company has had little market for the minus 3/16-inch hard, gray limestone. These fines contain a considerable amount of chert, making them undesirable for agricultural use since the chert has no soil-neutralizing value. It was to utilize this type of product that the company erected a concrete-brick plant three years ago a short distance from the crushing-and-screening plant. The equipment consists of a standard Dunbrik machine, complete with a mixer and a skip. After curing the units are stored under cover to keep them clean and dry. Besides the standard gray brick, a variety of solid-colored units are produced. From the start careful attention has been paid to see that only top-quality bricks are sold and the McCorkle units have earned an enviable reputation among builders and architects in central and southern Indiana. With practically no sales efforts the shipments have increased each year. In 1940 over 1,000,000 bricks were sold. Schoolhouses and residences provide the chief market although on the day the writer visited the plant the company accepted an order from United States Navy representatives for 100,000 bricks to be used in construction work at the Burns City (Indiana) Naval Storage Depot.

The company is a 50-50 partnership between father and son. Urso McCorkle, the elder partner, has relinquished most of the active management, however, to his son, C. U. McCorkle, who has devoted all his time to the business since he was graduated from the Indiana University School of Commerce in 1926.

Primary crusher and, at right, elevator to screen.

Triple-deck screen which does all the sizing.



Secondary gyratory crusher showing feed chute and discharge to elevator.

Cable Hoist (from page 61)

into the trucks which carry it to the skip hoist.

Prior to the use of drift quarrying we employed two stiff-leg derricks for hoisting the rock from the quarry, but since the installation of the skip hoist these derricks are idle virtually all the time, being used only for an occasional lift of rip rap. The main rip rap and rubble production is carried on at an upper level directly accessible to trucks.

The preformed crowd cable on the shovel, which receives very severe abuse, gives about 10,000 tons output before it has to be replaced. This compares very favorably with the 5,000 to 6,500 tons we were getting per cable when we were using non-preformed rope. We have also cut cable costs by using a preformed hoist cable that is about 10 feet longer than required; this gives us sufficient additional length so that a couple of times we can cut 5 feet off the end of the rope where it is dead-ended on the stick, since it is at this point that most damage occurs to the rope.

The distinctive feature of the whole operation is the reciprocating-type skip hoist. Instead of using rigid rail and structural guides it employs wire ropes. This saved 75 per cent. on the original installation cost, with corresponding savings whenever the quarry floor is lowered. In operation is has made a 1-man job out of one formerly requiring 5 men. Constructed during the business depression to cut costs, this hoist has proved its high efficiency and economy over a period of several years. Lowered by an 8¼- by 10-inch Mundy double-drum steam engine, it can readily handle up to 2,000 tons per 10-hour day hoisting 200 feet.

The head-frame and bin.

The skips are connected by a steel cable and counterbalance each other. They trip and dump automatically at the crusher. Two 1-inch guide cables for each skip are anchored by bolts to the quarry floor on a slope of 1½ inches per foot. The hoist was developed by R. N. Skraninka of our quarry, and by T. F. Bush, our former superintendent, and is patented.

When the Seller of Materials May Collect Payment from Municipality

By LEO T. PARKER

A GOOD resolution for the owners and officials of firms engaged in the production and sale of minerals is to keep out of litigation. Frequently it has been agreed by law experts that approximately 90 per cent. of all litigations involving contracts arise from misunderstandings or ignorance of purely elementary and simple principles of law, about which any executive, manager, or official may acquire legal knowledge that will enable him to determine and anticipate in advance the outcome of such legal controversies.

Obviously, undependable and unauthentic legal information is likely to result in legal controversies and resultant heavy financial losses and expenditures. Therefore, in order to acquire dependable legal knowledge it is advisable for readers to become familiar with the latest and leading higher-court decisions involving other persons and firms in their own type of business. This can be accomplished by maintaining for future reference records of the higher-court cases cited in these pages.

What Is Valid Contract?—First, it is important to know that the courts have consistently held that a valid and legal contract is an agreement between two or more parties by which each party is *expressly or impliedly* obligated to do something *not prohibited by law*. It is not necessary that any of the many kinds of ordinary contract be in writing, and it may be either expressed or implied. An expressed contract is one where the terms of the agreement are stated in so many words, and an implied contract is one of which the law presumes a promise of one of the contracting parties to perform a service for the other. A voidable contract is one in which only one of the parties may decide whether the contract shall be void or enforceable. The most common kinds of voidable contracts are those having present the elements of fraud, undue influence, misrepresentation, or mistake.

Another form of voidable contract is one in which an employee makes a contract for a municipality without any authority.

A void contract creates no legal obligations and, therefore, can not be made into a valid agreement by either party. Void contracts are those that are prohibited by a statute as immoral or otherwise illegal or against public policy.

Points of Universal Law.—It is well-established law in all localities that any person, or firm, who makes a contract with a municipality, county, or state is charged with notice of the extent of its powers and of the powers of its officers and agents with whom he contracts.

It is well known that public contracts are required to be made in a specific manner by state constitutions, statutes, city ordinances, and charters. It is, therefore, necessary that both the city officials and the owners of mineral plants consult these various authorities in order to be certain that the contracts ultimately will be upheld. Also, it is always necessary to determine whether there are any state laws or city ordinances which relate to the contract under discussion, keeping in mind that if a contract is made under a law or ordinance which does not conform to. or which contradicts, a state's laws, a city's charter, or other valid requirements, it is void.

For illustration, in the late case of Johnson-Olmsted Company *v.* City, 1 P. (2d) 928, it was shown that city officials entered into a contract for the purchase of materials without the acceptance of bids, notwithstanding the fact that the city charter provided that all contracts for local improvements should be let to the lowest reliable and responsible bidder.

In holding this contract void, the court said: "The contract is bad . . . because in any event competitive bids for such service must be had."

Contract Violates Constitution.—Another well-established point of law is that a contract made by a city is void if its provisions violate the state constitution. So held a higher court in the case of Tecumseh *v.* Butler, 298 Pac. 256. In this case it was shown that the constitution of the state forbids a municipality to incur an indebtedness beyond $100,000. Although the legal indebtedness of a certain city was more than $100,000 it entered into a contract of purchase for expensive equipment, and materials. Certain property owners filed suit to invalidate the contract on the contention that its terms violate the state constitution. The counsel for the city argued that a contract of this nature does not violate the state constitution. The higher court held the contract void.

In the case of Kentucky *v.* Paris, 58 S. W. (2d) 361 it was disclosed that a city issued bonds for the purpose of improving its waterworks plant. A city ordinance provided that the bonds and interest must be exclusively paid out of the revenues realized from the operation of the waterworks plant. The higher court held that these bonds did not create a debt against the city and the bond issue was declared valid, notwithstanding the fact that the amount of the bonds exceeded the limitation for indebtedness as provided by the state constitution.

Also, another common but important question is whether a city may enter into a valid contract for the purchase of minerals, where laws prohibit the municipality from incurring "indebtedness". It is important to know that the contract is valid if it contains a clause that clearly specifies that payment for the material is a "special" obligation payable exclusively from the public works on which it is used.

These points of the law were discussed in the recent case of Underwood *v.* Fairbanks, 185 N. E. 118, wherein a seller had sold certain materials to a municipality. The city officials agreed to issue to the seller $36,000 in pledge orders payable in 60 equal installments of $600.10 each, as payment of the purchase price. Suit was filed by certain property owners to invalidate the contract on the ground that the total indebtedness assumed by the city amounted to $36,000, whereas by provisions of the state constitution the maximum debt was limited to $20,000. Notwithstanding this argument the higher court held the city entitled to purchase the materials, and said:

"It is evident to our mind that the deferred installments as evidenced by the pledge orders are not obligations of the town and can not be payable

from the taxes or the general funds of said town."

Moreover, it seems that the courts in various localities have upheld this law, because where the debt is to be paid exclusively from the income derived from operation of a plant or works, as a water system, gas plant, electric plant, etc., there is no debt assumed, provided, of course, there are no strings tied to the agreement. (See 83 N. E. 462; 141 N. E. 222; 95 Pac. 1107; 295 S. W. 1004; 194 Ill. 457; 278 Ill. 287; 136 So. 37; 28 S. W. (2d) 356.)

Authority of Officials.—The courts in various localities have held states, counties, and cities liable on written contracts made by officials having proper authority although the contracts had defects, or mistakes, such as incorrect price, date, quantity or quality. These decisions are based on the rule of law that a municipality may ratify a contract which is not void by the law. Yet a contract, which for any reason is void when it is signed, can not be ratified, although the city appropriates the merchandise.

For example, in a recent case (28 S. W. (2d) 119) it was shown that a state law provides that city councils have authority to purchase supplies and materials for municipalities. A seller visited the city officials for the purpose of making a contract of sale for his products. The council was not in session, no meeting of it was called, and no action was taken by it. However, the mayor of the city instructed two members of the council to sign the contract for the city, and a written contract was signed in accordance with these instructions. Since the mayor, who orally directed the two councilmen to make the contract, had no authority to do so, the city later refused payment. It was argued that the city was liable for payment because the city council afterward had attempted to ratify the contract and the city had utilized the material. However, the court held the city not liable for payment, and said:

"In any event, the contract was void when made because executed on the part of the city without authority, and, being void, could not be ratified, because there was nothing to ratify."

Contract Violates State Law.—When a state law gives any set of public officials authority to purchase equipment for a municipality, a contract made in violation of these laws is void.

For instance, in Openchain *v.* Mercer, 17 S. W. (2d) 376, it was disclosed that a state law required municipalities to enact ordinances to authorize the making of contracts. Members of the board of trustees of an incorporated municipality in violation of this state law consulted with each other regarding making a contract and finally signed one for the purchase of mineral products but failed to pass an ordinance in accordance with the provisions of a state law which authorized and described how purchase contracts should be made. The court promptly held the city not bound to pay for the materials, stating the following important law:

"We must, therefore, hold that the only method by which the board of trustees could bind this defendant (city) . . . was by ordinance authorizing the contract."

Of course, considerable time, trouble and expense are required on the part of a seller to investigate the laws of each state and city in which a sale is made, but failure to do so may result in financial loss and litigation if perchance the sale transaction is not completed in accordance with the provisions of these laws. If, however, a state law clearly explains the legal methods of making valid sale contracts with municipalities, then there is little reason for investigating the city ordinances, because any ordinance which contradicts the state law is void. This is so because, under all circumstances, a city ordinance which conflicts with a state law is void. In other words, the state may determine the standard of quality, prohibit the production, sale or distribution of materials, and regulate the manner of the sale, so long as the regulatory provisions are neither unreasonable nor expressive, and a city can not change this law.

For instance, in the leading case of State *v.* Kinsey, 314 Mo. 80, it was shown that a city adopted an ordinance which conflicts with a state law. In holding the ordinances void, the court said: "A municipality can not lawfully forbid what the legislature has expressly authorized. . . ."

Sellers Presumed to Know Law.—Whoever contracts with a municipality does so with the implied notice of the limitations on its agent's powers. In other words, all sellers are presumed to know the law, and those who contract with a municipality, or furnish it materials, do so at the risk that the municipal officials, who make the contract or pass an ordinance, may not have proper legal authority, and also must correctly formulate the contract or ordinance. This rule of the law is applicable to all contracts.

Of course, under no circumstances may a municipality take or appropriate property or material belonging to another without reasonably compensating the owner. However, when a seller approaches municipal officials and makes a contract to sell his merchandise, and the municipality accepts and uses the merchandise shipped by the seller, it does not take or appropriate it. In fact, the municipality merely accepts the goods shipped to it by the seller, and in order that the seller shall have a legal right to collect money due he must prove that the contract is valid, made in accordance with controlling laws, and that the city officials had proper authority to obligate the municipality. All courts hold that those who contract with municipalities are bound to know that their contracts are authorized or implied by law.

The term "contract implied by law" is applied to a class of obligations created by law without regard to the assent of the parties upon whom the obligation is imposed. It is not a contract obligation in the true sense, but a contract constructively assumed by law. In other words, the liability exists from an implication of law that arises from the facts and circumstances independent of agreement or presumed intention. The intention of the parties is entirely disregarded, while in cases of express contracts the intention of the parties is of the essence of the transaction.

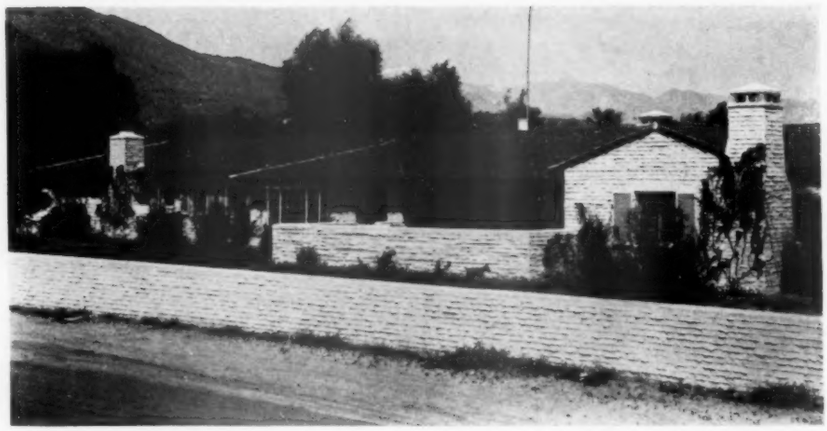
When a municipality appropriates private property or materials it implies reasonable payment. There is no express agreement. Neither has the property owner or seller a legal right to do anything except to demand payment and if the amount offered is not satisfactory he may sue to recover the amount he believes to be reasonable. But when a seller delivers his merchandise to a municipality under an invalid contract, the municipality does not appropriate the material from a legal standpoint, and therefore under the above-explained circumstances the seller can not recover payment.

Price Fixing *(from page 60)*

above those fixed by the manufacturer group for purchases, thereby rendering the whole price-fixing program ineffective. To insure effective control of the industry, therefore, manufacturers in the group, where they themselves do not constitute the major proportion of the industry, may seek to induce the independent manufacturers to join the group, for this purpose exerting every possible form of pressure. In the case of reluctant independent manufacturers the manufacturer group may exert powerful pressure through various harassing tactics by the manufacturers in the group, such as "price wars", selling below cost, price discrimination, "fighting brands" or "fighting ships", cutting off sources of supply, and the like. In the case of truly recalcitrant independent manufacturers these same forms of pressure as well as other forms may even be used to eliminate these manufacturers from the industry, or at least compel their adherence to the prices and policies of the manufacturer group.

Prosaic Materials Supply Background for Glamour at Noted Desert Resort

EVEN in such a glamorous place as Palm Springs, California, where movie stars cavort between pictures, someone must do such unglamorous things as producing sand and gravel and making concrete blocks. Across the tracks in this highly-publicized desert resort is a small industrial section which takes care of the every-day needs of this community. In this section is located the office and yard of the Palm Springs Builders' Supply Company, which sells most of the building supplies used in this growing community. During the height of the winter season Palm Springs has a population of about 12,000. In the summer only about 800 remain and most of these are construction workers and their families.

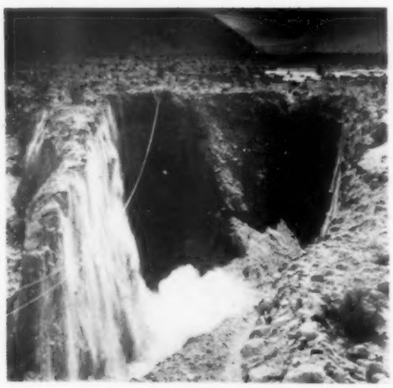


Concrete units made by the company were used to build this beautiful Palm Springs residence.

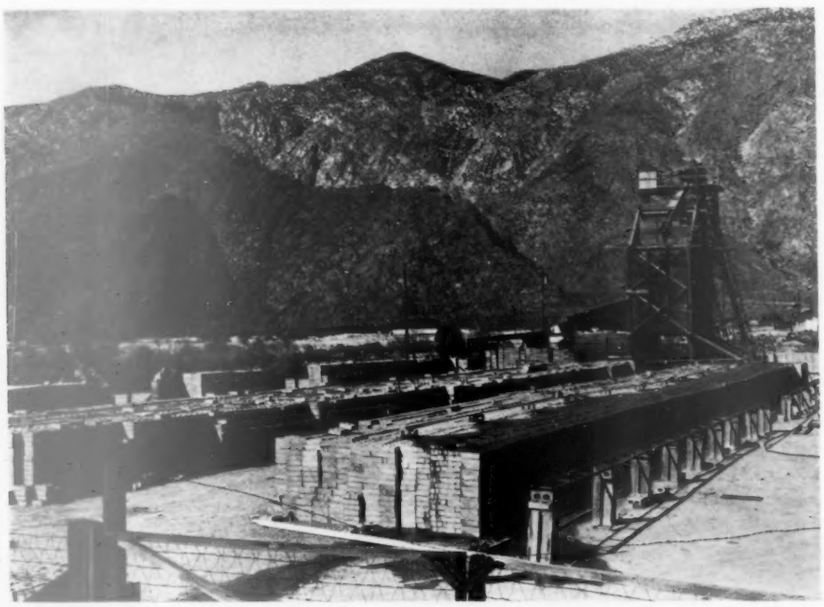
This company was formed in 1926 with A. F. Hicks as president to produce and sell building materials of all kinds. At that time a sand-and-gravel plant was operated in the present yard and material was hauled to it. In 1928 the company built its concrete-tile plant. In 1931 a new sand-and-gravel plant was built in Whitewater Canyon, about 10 miles from Palm Springs and this plant was rebuilt in 1936 with all new Stephens-Adamson equipment. It now has a capacity of 40 tons per hour.

The deposit is in a dry desert wash which during an infrequent rain may become a raging torrent. It extends to an unknown depth, wells drilled to a depth of over 200 feet having failed to penetrate the deposit. It consists of about 60 per cent. rock which ranges up to bowlder size. A 1-cubic yard drag-line scraper, operated by a 50-horsepower double-drum hoist is used to excavate the material to a depth of about 60 feet. As in most deposits in this state, the material stands up in a vertical wall and occasional blasting is necessary to keep the scraper from getting buried. The procedure followed is to dig holes about 6 feet into the bottom of the face and shoot 50 sticks, or 12½ pounds, of explosive in each hole.

By W. E. TRAUFFER



The result after a blast had broken down material for the scraper in the pit.



Part of the yard storage and aggregate bunkers.

The material is discharged from the scraper through a bar grizzly into a hopper over the primary jaw crusher. A reciprocating-plate feeder discharges the crusher product on a belt-conveyor. This drops the material on a second bar grizzly which diverts the oversize to a secondary roll-crusher. The product of this crusher and the material falling through the grizzly are carried to the top of the plant by a bucket-elevator. Sizing is done by a 2-deck Pacific type vibrating screen. The oversize gravel is returned through a chute to the secondary crusher. Sand goes to a washing cone from which it can be discharged either into a bin or on a 100-foot stock-piling belt-conveyor. The gravel that passes over the bottom deck of the screen can be discharged into a

(Continued on page 68)

Drag-line stripping the Maertens deposit.

Crane loading one of the company's 20 trucks.

General view of the plant from across the pond.

Markets Output Through Dealers

THE gravel deposits west of Utica, Michigan vie with those in the well-known Oxford district as suppliers of metropolitan Detroit's construction needs. Four years ago, Joseph Maertens, a general contractor, acquired one of the choicest of these deposits and established a wet-pit operation under the name of the Maertens Sand & Gravel Company. To-day the company is doing a big business, with most of its output consigned to material dealers in Detroit. It operates a fleet of 20 motor trucks, many of them 4-wheel and semi-trailers, to make deliveries. Several customers also call at the plant with their own trucks. None is shipped by railroad.

A straight suction dredge is used to bring up the material. It is equipped with an 8-inch Amsco pump driven by a 150-horsepower Murphy Diesel engine. The engine and pump have been in constant service since the deposit was opened.

No bowlders are encountered and the material pumped up to the plant is sized by a 3-deck vibrating screen, two flumes carrying the sand off for settling.

None of the gravel is crushed.

All the finished material is held in open storage and is rehandled or loaded into the trucks by two ¾-cubic yard clam-shell cranes. A ¾-cubic yard dragline is used for stripping. All three of these excavating machines are Northwests and were placed in service during the last 24 months.

The main office of the company is located in Grosse Pointe, a Detroit suburb. Joseph Maertens, Jr., is superintendent at the plant.

Suction dredge working in a newly-stripped area.

1,700-Foot Pipe-Line Carries Wash Water to Gravel Plant

THE Killins Gravel Company opened its plant west of Ann Arbor, Michigan in 1920 as a dry-screening operation. Six years later, because most specifications for concrete aggregates were insisting on washed material, the company began washing its products.

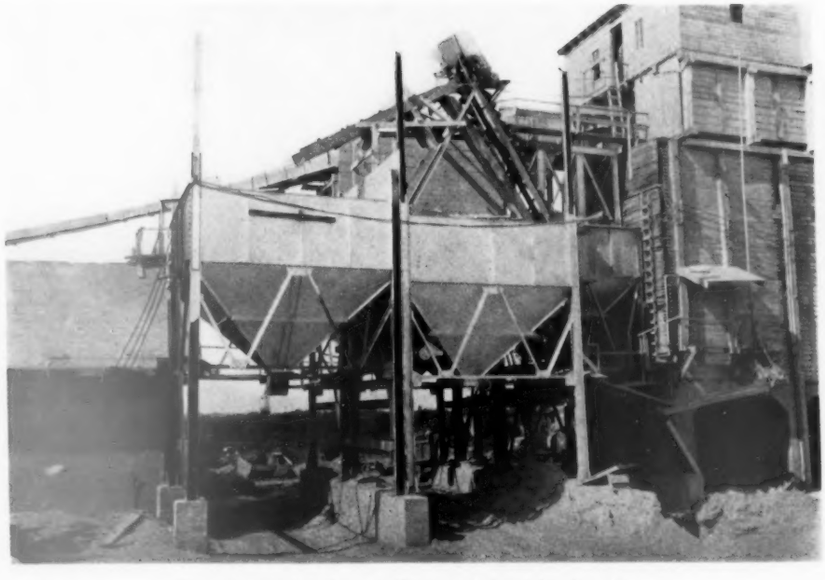
The plant is located on a hill, part of the terminal glacial moraine which forms the deposit, and the only logical water supply was a small spring-fed lake located more than ¼ mile distant. To bring the water up 124 feet to the top of the plant 1,700 feet of 6-inch Naylor spiral welded pipe was installed. The pump had a capacity of 500 gallons per minute and the installation worked quite satisfactorily for a couple of years until the processing plant was enlarged and the wash-water requirements were doubled. A 5-inch Fairbanks-Morse centrifugal pump was then put in service and the

The Killins plant as viewed from the scalehouse.

6-inch pipe-line was replaced with 500 feet of 10-inch and 1,200 feet of 8-inch Naylor spiral welded pipe. This system has provided an ample supply of water through the years and is still giving excellent service, according to Glenn Killins, head of the company.

This summer the company is supplying aggregates for the new $47,000,000 Ford aircraft-bomber plant under construction at Ypsilanti, a few miles distant. This job calls for the delivery, among other sizes, of 70,000 cubic yards of Number 4 sand. Production facilities had to be enlarged to meet this demand for sand. A second Telsmith settling tank was added and three Butler steel sand-loading bins with a combined capacity of 225 tons were installed, replacing an old wooden sand bin. A short Telsmith bucket-elevator carries the damp sand, as discharged from the tanks into the first of these bins, to either of the other two new bins for drying before it is loaded into the trucks.

LEFT—Part of the 1,700-foot spiral-welded pipe-line.



The new sand-drying facilities and truck-loading bins.

Palm Springs (from page 66)

bin or on another 100-foot stock-piling conveyor. Each of the stock-piles has a capacity of 1,500 cubic yards and trucks are loaded in tunnels.

These materials are sold mainly to building contractors for local work and several dump trucks are kept busy during December. Considerable material

This view of the gravel plant shows the truck-loading tunnels.

was sold for use in the Colorado River Aqueduct when this was being built.

At the company's yard in Palm Springs aggregates are stored in a bunker for truck loading and for use in the products plant. A horizontal mixer is used to mix concrete for the Flam vibrating block machine. As in other sections of the West, 4- by 8- by 12-inch concrete tiles are in greatest demand for all types of buildings. Many other sizes and types of building units are made, including slump tile. Usually over 100,000 tiles are kept in storage. This plant is operated the year around except for the summer months, when the temperature usually hits the 120-degree mark and the hot dry wind keeps the units from curing properly. A spray system is used in the yard and most of the buildings are air-conditioned.

Machine which produces blocks by vibration.

Cement in Other Lands ..... a Review of Current Technological Developments

Translated and Abstracted by JOHN H. D. BLANKE

SHOICHIRO NAGAI tested in an autoclave the behavior of standard Portland cement, of cements with low heat of hydration, of cements with high iron-oxide content, of metallurgical cement, and of mixed cement having additives consisting of soluble silicic acid; and determined that the mixed cements with high iron-oxide contents. and mixed cements containing 30 per cent. soluble silicic acid are more resistible than the other kinds of cement. —*Dainippon Yogyo Kyokwai Zasshi* (Journal of Japanese Ceramic Association), vol. 48, pp. 66-67 (February, 1940).

Disintegration Studies of Cement Clinker

H. Elsner v. Gronow recalls that cement clinker disintegrates in extended storage; and he discusses the reasons for the resulting improvement in grindability. At present it is held generally that the conversion of the β-dicalcium silicate into the γ-dicalcium silicate which is combined with a 10 per cent. increase in volume, is a definite cause for the disintegration of the clinker—the density of the β-dicalcium silicate being 3.28, and that of the γ-dicalcium silicate being 2.97. However, dilatometric measurements conducted in 1937 to 1940 showed that the β-γ conversions which allegedly causes the disintegration of the clinker, did not even occur in Portland cement, also not in typical disintegrated clinker, in so far as it was well sintered. Investigated first was a Portland cement with 92 to 93 per cent. lime saturation, which contained noteworthy quantities of dicalcium silicate. Disintegration of the clinker occurred also under the exclusion of air in petroleum, thus excluding the possibility that disintegration could be based on the hydration of free lime or of lime silicates.

The test results are described in detail; including the design and use of the dilatometer with a calibrated capillary for the determination of the volume variation in the disintegration of the clinker.

It is concluded that the disintegration of the Portland-cement clinker in storage, and the improvement of the grindability of the clinker in dependence upon the period of storage, is to be traced to the reactions in the so-called "intermediate substance," in the undercooled sinter fusion. At 1,400 to 1,450 degrees C. there are present in most of the Portland cements from 20 to 24 per cent. sinter fusions. These *chill glassy* in quenching even though often only in small quantities. The bursting of the glassy "intermediate substance" and, as a result from this, the disintegration of the cement clinker, are favored also by the small heat expansion of the clinker mineral as compared to the glassy congealed sinter fusion. A disintegration of the clinker as a result of a conversion of β-dicalcium silicate to γ-dicalcium silicate could be brought in question only in weak burning.—*Zement,* vol. 30, no. 11 (March 13, 1941), pp. 141-145.

Silicic Acid-Fat Portland Cements

Upon the basis of research work of the Leningrad Cement Institute, Russia is now making silicic acid-fat Portland cements in such a manner that 60 to 70 per cent. pozzuolana, diatomaceous earth or slurry from prepared white bauxites is ground with the clinker. This cement excels because of its special resistance to attack by sulphate solutions. In 1938 the production of this cement reached 16 per cent. of the total output.—*Genie Civil* vol. 116, no. 15. pp. 235-236.

Shaking Compactor for Cement Prisms

F. Kaufmann reports concerning the applicability of the shaking compactor in the preparation of cement specimen prisms of the 4- by 4- by 16-mm. size required in German Standard DIN 1166. Since all the operations in the test procedure should be conducted uniformly, and compaction of the soft mortar by hand in prism preparation was regarded as not assuring sufficient uniformity. Experiments were made with a precision shaking compactor and the results obtained in comparative tests are presented.

In these tests the water-cement value of 0.60 was not varied and the proportion of fine sand to standard sand remained 1:2. The most favorable water content for shaking of the mortar was found to be 10 to 12 per cent., the heretofore customary water content of about 15 per cent. yielding too soft a mortar. At a vibration amplitude of 1 mm. the vibrations should be at least 3,000 per minute. At a vibration of 3,180 per minute the most favorable amplitude was 1 to 2 mm. The period of vibration should be 60 to 120 seconds. In extended shaking the strengths still increased somewhat. However, the uniformity of the test results was no better for the compactor-compacted prisms than for the hand-compacted prisms. Further tests are to be made.—*Zement,* vol. 29, no. 37 (September 12, 1940), pp. 469-474.

Particle Composition of Concrete Aggregates

Dr. K. Seidel reports on investigations intended to show how the retesting of the composition of concrete for the purpose of construction control can be extended also to the particle composition of the aggregate; this will facilitate the judging of a concrete and the finding of errors in concrete production.

The difference between the calculated compressive strength of concrete and that obtained by test gives the first criterion of the quality of the aggregate. Several series of tests were made to fix the limit of the validity and applicability of this principle, and to establish *what* formula for the pre-calculation of compressive strength of concrete is the most suitable for judging the particle composition of the aggregate in the placed concrete.

All formulas for the pre-calculation of the compressive strength of concrete were divided into three groups: (1) those using the water-cement ratio as a basis (including Feret, Abrams, Talbot, Graf); (2) those using the cement-water ratio (including Bendel); (3) and those in which the volume-weight is regarded as the variable. Tests were made on concrete to check the validity of some of these formulas

for pre-calculation of the compressive strength of concrete. It was determined that the formulas agree well with practice within certain limits when using the same aggregate materials. The formulas were tested for their suitability to furnish a measuring stick for the quality of the aggregate in concrete, and the Bendel formula was selected as the most suitable for it.

A gravel quality figure was set up which, by aid of the compressive strength of the concrete, the contents of water and cement in a cubic meter of placed concrete, and the volume weight of fresh concrete, points to the quality of the aggregate in the concrete—first of all in regard to its particle composition.

In the Bendel formula the volume-weight of fresh concrete was entered in place of that of 28-day concrete and, since this formula applies only to normal cement, it was extended by adding a factor by which the standard compressive strength of the used cement is entered in the formula so that the gravel quality figure set up here now has validity for concrete from cements having greatly diversified standard strengths.

The Bendel formula is: $W = -1.52w + 1.00z + 1{,}100\ (R\text{-}2.14)$ in which W is concrete compressive strength, w is the amount of water in one cu.m. of placed concrete, z is cement content in the same volume unit, and R is the volume-weight of the concrete after 28 days.

Amended to the gravel quality figure, the formula reads:

$$X = \frac{W}{(-1.52w + 1.00z \,.\, N/500 + 1{,}100)\ (R\text{-}2.14)}$$

The cement portion of the concrete, designated as z, being for standard cements only, was changed to apply to all cements by adding to $1.00z$ the following factor $N/500$, in which N is the standard compressive strength in kg. per sq. cm. of the used cement after 28 days' mixed storage. If the values of the gravel quality figure exceed 1.2, the proportion of sand is too high; and if it recedes below 0.6, the proportion of gravel is too high.—*Zement,* no. vol. 30, no. 3 (January 16, 1941), pp. 34-38; no. 4, pp. 49-52.

Method for Determining Silicic Acid in Cement

W. T. Illiminskaja dissolves 0.5 g. clinker in 20 cu. cm. of 60 per cent. chloric acid, while stirring. The solution is left uncovered on an electric heating plate until the escape of white vapors, then it is covered with a watch glass and heated 10 minutes to boiling. After cooling to room temperature the watch glass as well as the cup walls are rinsed off with 30 cu. cm. of water, after which 25 cu. cm. of hydrochloric acid (1:1) is added. The filtered precipitate is washed twice with hydrochloric acid (1:1) and then washed out well with water, and then caused to glow. In the analysis of substances insoluble in chloric acid, as for example aluminas, 0.1 to 0.25 g. of the insoluble substance is first of all converted with the necessary amount of soda, after which the cooled fusion mass is dissolved in 30 cu. cm. of chloric acid, and the procedure continued as above.—*Betriebs-Lab.* (Russia), vol. 8, January, 1939, pp. 102-104.

Structure of Hydrated Portland-Cement Clinker

B. Tavasci reports concerning the structure of hydrated Portland-cement clinker and old hydrated Portland-cement clinker; and describes suitable aids and a test procedure used in observing the material in reflected light without affecting the material. He describes from his own investigations how the quantity of not-yet-hydrated cement and of free calcium hydroxide varies when the water volume added to the cement specimen is different.—*Zement,* vol. 30, no. 4 (January 22, 1941), pp. 43-48; no. 5, pp. 55-58.

Report Concerning Ferrari Cement

F. Ferrari reports that the Ferrari cement has an alumina-iron oxide modulus of 0.64. Besides using the customary raw materials, also those containing iron oxide (roasted iron pyrite) are needed. As compared to normal Portland cement, the manufacture of Ferrari cement has diverse advantages, including saving in fuel, increase in output, improvement in quality in reference to strength, shrinkage and chemical resistance ability.—*Cemento Armato, Ind. Cemento,* vol. 36, pp. 200-204 (December, 1939).

New Concrete Employs Magnesia-Bearing Cement

Rudolf Zollinger, after four years of occupation at this problem, describes the status of research in the so-called K-concrete. One of its components consists of caustic burned magnesia, and the other comes dissolved in water as magnesia chloride liquor; in which the proportion of $MgO : MgCl_2 : H_2O$ must be definite for obtaining a desired effect. Considerable test data are presented.

Research to date has determined that in the three-substance system MgO—$MgCl_2$—H_2O in combination with mineral admixtures there are strengths attained which go far beyond the strengths obtained as yet with Sorel cement. It has been determined also that in this system a strength maximum is present at a molecular composition of $8MgO \,.\, MgCl_2 \,.\, 15H_2O$. The test data presented show that in this combination, plus the mineral aggregate used, pure oxychloride strengths can not alone be involved, but that beyond them, as in cement concrete between CaO and hydraulic agents, there are reactions here also between MgO and hydraulic agents.—*Zement,* vol. 29, no. 46 (November 14, 1940), pp. 587-592; no. 47, pp. 599-603; no. 48, pp. 615-619.

Structure of Hydrated Portland Cement

B. Tavasci reports that when cements and clinker are examined by the metallographic investigation method hazes appear on the pictures of strong enlargements, since the slides are porous. This can be avoided if the mass is laid in vaseline oil. Suitable for caustics are special solutions of 0.5 per cent. HCl in absolute alcohol and a 2-per cent. solution of iodine in asolute alcohol; in the first instance the period of action should be 10 seconds and in the second case it should be 30 seconds.

Upon the slide views there can be noticed, besides the non-hydrated clinker, the following constituents: *(a)* granular or crumbly distributed crystals of free hydrate of lime; *(b)* a base mass with small needles; *(c)* finely distributed in it; *(d)* small plates of various sizes; and *(e)* gypsum as far as this was contained in the raw material *(b)* is an isotropic gel whereas *(c)* represents a silicate different from it, which possibly has the composition $2CaO \,.\, SiO_2 \,.\, Al_2O_3 \,.\, aq$; *(d)* represents the hydration product of the celite and contains essentially calcium aluminate.—*Chim. e Ind.,* vol. 21, pp. 656-661 (December, 1939).

Foam Flotation of Raw Cement Slurry

Dr. G. Haegermann describes the classification and foam-flotation process introduced in North America, with special treatment of the West Conshohocken plant of the Valley Forge Cement Corporation and several other cements works.

Thin elutriation of the raw material is in itself not new in the German cement industry, for it was applied in the first German cement works but later abandoned due to many accom-

panying difficulties, including the removal of excess water, adjustment of the raw material, and extraction of the raw material from the large settling pits especially in winter.

In reference to the economy of the process, the author concludes in part as follows:

The raw-material situation of the German works is with few exceptions such that the raw rock is high enough in lime content. In a few works, however, high-percentage rock is brought in from other quarries. In this case, and also when dumped or refuse material is to be prepared, the question of economy alone is of deciding importance for the introduction of foam-flotation preparation. Works whose raw-material situation allows the production of unobjectionally composed Portland cement and high-value Portland cement can reject the foam-flotation process. But when there is a desire to make Portland cement of special composition, which deviates from the customary, for example, by a low alumina content at relatively high iron-oxide content, then the foam-flotation process gains in importance. For the preparation of sandy clays or soft rock with undesirable hard admixtures in most cases the gravity preparation method used also in Germany (however in different form) alone (without foam flotation) is sufficient.

The introduction of the process described into the cement technique is without doubt, for the cases coming in question, to be indicated as a very noteworthy advance.—*Zement,* vol. 29, no. 49 (December 5, 1940), pp. 627-632; no. 50, pp. 641-644; no. 51, pp. 656-659.

Chemical Analysis of Clinker and Cement

P. P. Budnikoff and S. S. Zhukowskaja recommend a method which makes possible a complete analysis of Portland-cement clinker, Portland cement, and blast-furnace slag in one to two work days instead of the three to five days required by the customary method. The second variant of this analysis method makes it possible to vary the latter in reference to the sequence correctness in the determination of individual components in accordance with the demands placed on the analysis. Both methods make possible the volumetric determination of all the metals except titanium. These methods reduce materially the use of platinum tools and equipment. Descriptions, tables and procedures are presented of the analysis methods for the various materials to be analyzed.—*Zement,* vol. 30, no. 1 (January 2, 1941), pp. 1-8.

Investigations Concern Tricalcium Aluminate

Dr. Wilhelm Eitel, director of the Kaiser Wilhelm Institute for Silicate Research, concludes in this report that, upon the basis of the results of thermic analysis, a preliminary phase diagram can be given for the system CaO-5CaO. $3Al_2O_3$-CaF_2; it is of the simplest eutectic type, without the formation of mixed crystals and without a field of primary separation of 3CaO. Al_2O_3. It is shown through thermic demonstration tests that 3CaO. Al_2O_3 disintegrates completely into free lime and 5CaO. $3Al_2O_3$ in the presence of CaF_2 as a mineralizer. Upon the basis of these relations, the phase diagram of the system CaO-Al_2O_3, formerly given by Rankin, needs revision upon the side of the basic lime-aluminate mixture.

The author supports his conclusions with diagrams, tables and pictures, giving the results of X-rayographic and microscopic examination of the constitutional synthesis of test batches, and also of the forms of development of the kinds of crystals.—*Zement,* vol. 30, no. 2 (January 9, 1941), pp. 17-21; no. 3, pp. 29-32.

Aluminate-Silicate Cement in U.S.S.R.

D. I. Malenkich reports that the Russian cement plant in Kuwschinsk makes an aluminate-silicate cement of the following composition: silicic acid 16 per cent., alumina 32 per cent., lime 50 per cent., iron oxide 0.3 per cent. The product is manufactured from suitably composed blast-furnace slag, which flows out on a level surface. In cooling, the slag disintegrates to a powder, which passes 97 per cent. through the 900-mesh per sq. cm. screen, and 80 per cent. through the 4,900-mesh per sq. cm. screen. The essential increase in strength occurs during the first 4 days. The cement is stable in freezing, but not suitable for marine construction. The addition of calcium chloride proved unfavorable. To accelerate hardening steam treatment at 50 degrees C. may be given.—*Ind. Baumater* (Russian), February, 1940, no. 2, pp. 37-50.

Glass as Constituent of Portland Cement

B. Tavasci discusses the use of glass as a standard constituent of celite in Portland-cement clinker with references to published data, and then reports on his own investigations to determine if glass is actually present in clinker. Micrographic specimens are observed under reflected light in connection with suitable caustics. A clinker of the following chemical composition was used: loss on ignition, 1.3; Fe_2O_3 and Al_2O_3, 9.28; SiO_2, 21.3; CaO, 66.03; MgO plus alkali plus remainder 1.96; Al_2O_3/Fe_2O_3 is 2. In this clinker alite overweighs belite and less than 2 per cent. of free lime is present. This clinker was subjected to various thermic treatments to meet the best requirements for indicating the presence or absence of glass. Different methods of determination are described and 20 slides shown.

The observations show the presence of a glassy phase in the clinker chilled in water. This phase is formed from celite which is present on the surface of the granules but already modified inside the granule A critical discussion of the results is added.—*Zement,* vol. 30, no. 7, (February 13, 1941), pp. 83-85; no. 8, pp. 100-103.

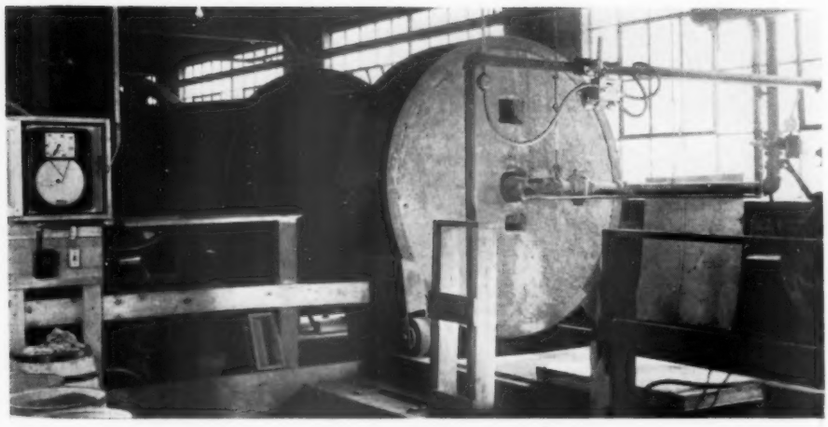
Particle Strength of Metallurgical Pumice

F. Keil reports from the Research Institute of the Association of German Iron Portland Cement Works on metallurgical pumice for the production of light concrete. The method developed for determining particle strength is described.

In comparing different kinds of metallurgical pumice a definite strongly-limited particle stage must be used, since the volume weight is very strongly dependent upon the particle size. The particle stage of 7 to 15 mm. seems to be most suitable. The results show that the particle strength tested in this manner is essentially dependent upon the volume weight. Therefore, in many cases the determination of the volume weight will be sufficient for a rough judgment of the particle strength.

The test results are affected somewhat by the preliminary treatment of the pumice, so that material to be tested should be handled uniformly. One air-dried pumice loosely placed had the following volume weights in kg. per liter: 15 to 30 mm., 0.15; 7 to 15 mm., 0.16; 3 to 7 mm., 0.26; 1 to 3 mm., 0.26; 0.2 to 1 mm., 0.45; 0.0 to 0.2 mm., 0.61; whereas corresponding sizes of Rhine gravel sand ranged as follows: 15 to 30 mm., 1.42; 7 to 15 mm., 1.48; 3 to 7 mm., 1.45; 1 to 3 mm., 1.51; 0.2 to 1 mm., 1.45; 0.0 to 0.2 mm., 1.45. The weight of a mixture of 0 to 7 mm. pumice was 0.39; that of the gravel sand 1.71; using by weight 1.8 per cent. of 0.0 to 0.2 mm., 50.8 per cent. of 0.2 to 1 mm., 16.8 per cent. of 1 to 3 mm., 30.6 per cent. of 3 to 7 mm.—*Zement,* vol. 29, no. 45 (November 7, 1940), pp. 578-581.

Calcining Abrasive Grains



The automatically-controlled grit kiln.

HIGH temperatures, quite naturally, are necessary for the satisfactory calcining of abrasive grains, yet, if the temperature is above the critical range for the material there is danger of the grits fusing and the abrasive losing its cutting properties. On the other hand, if the material is insufficiently heated it is not properly processed. Permissible thermal tolerances are narrow, despite which—rather because of which—the calcining of abrasive grits in rotary kilns at the plant of the American Abrasive Company, Inc., Westfield, Massachusetts, is placed under automatic temperature control that is so sensitive that the active kiln heat never varies over 1 per cent. plus or minus.

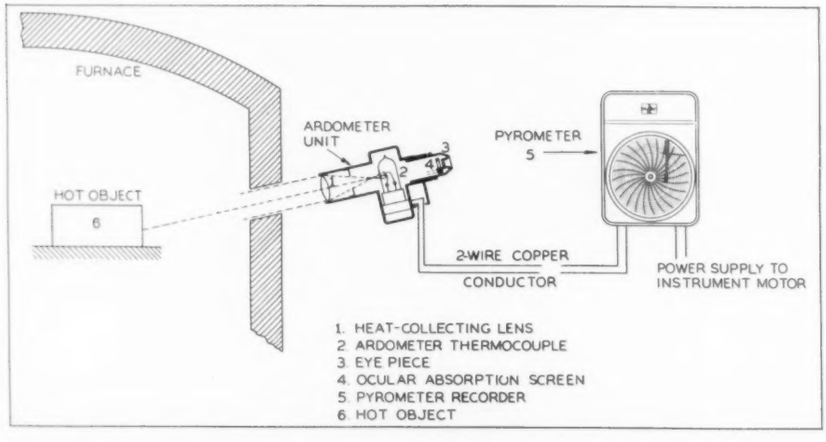
It is necessary to maintain a definite temperature in the kiln in order to produce a uniform product, otherwise cracking and disintegration of the materials will occur.

The abrasive material is placed in a large horizontal, oil-fired, rotary kiln and a Bristol Ardometer—a temperature sensitive device for measuring the surface temperatures of "glowing hot" objects—is trained on the inside wall of the revolving kiln—through an observation hole cut through the front wall of the oven. This compact temperature detector, resembling in appearance a small telescope or microscope, consists essentially of a heat-collecting lens at one end, a number of small radiant heat thermocouples connected together, and an eye piece, or ocular lens, at the other end for sighting the instrument—the whole assemblage inclosed in a heavy cast-aluminum, water-jacketed housing.

The water-cooled Ardometer, mounted at or slightly above the level of the observation hole in the end of the kiln and at a sufficient distance for protection against damaging heat effects, is connected electrically to a Bristol Pyromaster Potentiometer indicating and recording controller placed conveniently at the side of the discharge end of the kiln. The latter instrument both posts the Ardometer observed temperatures instantly on a clear-vision indicating scale and maintains a continuous graph record of the kiln temperatures on a slowly rotating timed-chart during the entire run of the kiln. The Pyromaster controller also actuates load contacts automatically that adjust the opening of a North American motorized valve that governs the oil and air feeds to the kiln burner.

In operation it is only necessary to aim the Ardometer, set the Pyromaster for the desired, predetermined kiln temperature and throw a starting switch, all subsequent control and guidance being automatic and carried forth with unfailing accuracy and certainty. Little or no attention to the controller instrument is required, other than the routine cleaning of the lens, without which the accuracy of the temperature readings may in time be impaired, the thermocouple assemblage being exceedingly sensitive to the heat rays picked-up by the heat-collecting lens.

The sensitiveness of the thermocouple assemblage to temperature changes—on a par with that of rare-metal thermocouples—is due to the small mass of the several connected thermocouple units, the reason also for the virtual avoidance of any thermal time lag.



Diagrammatic lay-out of the temperature-control system.

Research Widens Use of Nepheline Syenite

Ceramic research on nepheline syenite as a substitute for straight feldspar continues slowly to extend its field of usefulness, though the glass industry still remains the main outlet. Canada, with its extensive deposits of high-grade rock yielding a low-iron product by magnetic separation, is still the sole source of the material for industry on this continent. The competitive threat of nepheline syenite to the Canadian feldspar industry seems to have been temporary, judging by recent production figures for the latter mineral; these show output for the first seven months of 1940 as double that for the same period last year.

Recent experimental work in the Bureau of Mines laboratories at Ottawa has shown good results in the cleaning of nepheline syenite from iron-bearing impurities by flotation methods, followed by a final magnetic separation treatment to remove traces of finely divided magnetite.

PERSONAL MENTION

HENRY O. REGNER, West Bend, Wisconsin has been made vice-president and treasurer of the Northern Gravel Company, Barton, Wisconsin. J. C. BUCKBEE of Los Angeles is president.

JOHN PARKS has added considerable equipment to his sand-and-gravel plant at Perry, Michigan, in recent months.

IVAN KRABBE, engineer at the Monolith Portland Midwest Company's cement plant at Laramie, Wyoming, for the past three years, has accepted a position as superintendent of a new manganese-sintering plant of the Anaconda Copper Mining Company at Anaconda, Montana. The Montana plant was recently erected and has been in operation since early in July.

C. W. HINER has been appointed Nebraska district engineer for the Portland Cement Association succeeding H. J. Young, who resigned March 15 but has been acting resident engineer since that date, it was announced by General Manager W. M. Kinney at Omaha. Mr. Hiner has been connected with the association 13 years, and has been with the Nebraska engineering and construction industry for 20 years. The district office of the association was moved recently from Lincoln to Omaha, where the address is 504 South Eighteenth street.

ROBERT BURCH, of Dallas, Oregon, is about to move his gravel plant from that point to Sheridan, Oregon.

MILTON E. JOHNSTON, WARREN W. JOHNSTON AND VERN E. JOHNSTON have engaged in business at Escondido, California, under the style of Johnston Brothers Limestone Company.

E. E. LARSON has taken over the management of the Lee Bryan gravel pit located near Burns, Oregon.

J. Walter Snavely

J. WALTER SNAVELY, district manager in the Houston territory for seven years, has returned to the sales department of the Conveying and Engineering Products Division of the Chain Belt Company at Milwaukee. Mr. Snavely graduated from the University of Wisconsin and entered the employ of Chain Belt Company as a student apprentice in the year 1927. W. A. PITTS, formerly representative in Oklahoma City, has been appointed district manager of oil-well sales at Houston. GEORGE HUNT has been appointed district manager of industrial sales with headquarters at Dallas.

J. D. and F. W. MORSE have opened a sand-and-gravel plant at Harrisburg, Oregon.

JASPER WHITING, 73, inventor of the use of blast-furnace slag and other waste products as raw-materials in the manufacture of Portland cement, died August 18 at Dublin, New Hampshire, after a long illness. He served as a major with the American armed forces in World War I.

WILLIAM A. SMOOT, 63, president of the Smoot Sand & Gravel Company, Washington, D. C., and a former mayor of Alexandria, Virginia, died recently at his home in Alexandria.

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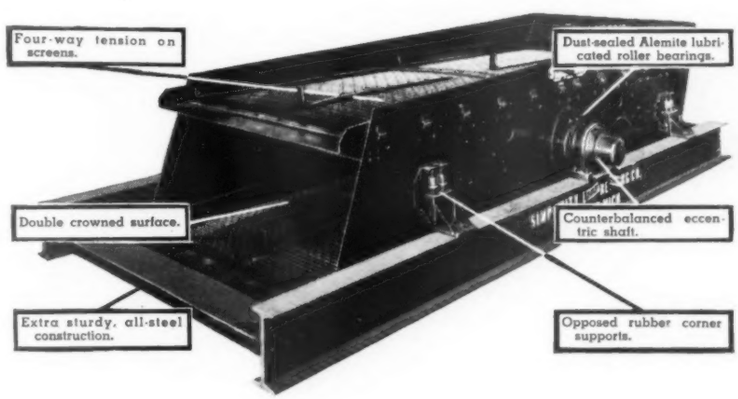

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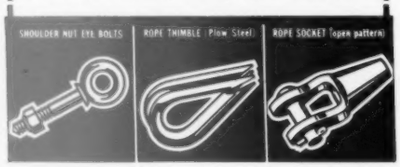

EVALD ANDERSON, 57, technical director of the Western Precipitation Corporation, died July 19. On graduating from the University of California in 1913 he joined the Western Precipitation Corporation with which he spent his entire business career. His creative efforts led him into many fields and wherever he was active he established lasting friendships and gained the recognition and respect of his technical associates. In February, 1940, he was presented with a Modern Pioneers Award, sponsored by the National Association of Manufacturers, in recognition of his outstanding accomplishments. He was a native of Sweden.

Evald Anderson

BURR H. SIMPSON, 56, president and general manager of the West Virginia Sand & Gravel Company and of the Standard Brick & Supply Company, both of Charleston, West Virginia, died August 10 at his home in Buckhannon, West Virginia. Formerly West Virginia State Road Commissioner, Mr. Simpson had served in that capacity from August, 1935, to March 15, this year, when he resigned to head the Charleston concerns.

LEE S. TRAINOR, for many years head of the Highways Bureau of the Portland Cement Association and more recently chief engineer of the National Lime Association at Washington, D. C., passed away Sunday, August 10. He had been in failing health for a number of years. Burial was in Centralia, Illinois.

LEW WALLACE BROOKS, president of the Brooks Equipment & Manufacturing Company, Knoxville, Tennessee, died July 21.

CHARLES H. BETZENBERGER, 49, assistant sales manager of the Ransome Concrete Machinery Company, Dunellen, New Jersey, died of heart attack at his home in Plainfield, New Jersey. Surviving are his widow, a daughter, a brother and three sisters.

CHARLES H. WILBEE, founder of the Wilbee Concrete Products Company, Jackson, Michigan, and well known concrete burial-vault manufacturer, passed away recently at his home in San Marino, California, where he had been living in retirement since 1937. He was 77 years old.

EMPLOYMENT AND PAY-ROLLS

(Compiled for PIT AND QUARRY by Isador Lubin, Commissioner of Labor Statistics, U. S. Dept. of Labor.)

Industry	Establishments	Number of Employees	Pay Rolls (1 week)
Cement:			
May, 1941	130	21,614	$667,036
June, 1941	130	21,933	700,423
Percentage change		+1.5	+5.0
Quarrying and non-metallic mining:			
May, 1941	833	29,808	770,682
June, 1941	833	30,254	805,076
Percentage change		+1.5	+4.5

FOREIGN PRACTICE

Chemical Reactions as Concrete Hardens

C. Rodt presents, on the basis of available published research data of various investigators, a critical discussion of the reactions that occur in the hardening of cement paste, and he concludes as follows: In the investigations and observations made to date concerning the hardening procedure of the cement its content of alkali silicates and alkali aluminates was not considered. Since these alkali combinations must have a decisive influence on the hydroxyl concentration of the cement fluid, they should not be left out of consideration, especially since the caustic alkalies, once they are liberated in the cement owing to the always present free lime hydrates in cement, must also be retained permanently as such in so far as they are not leached out in water storage.

Experiments with fully alkali-free cement in comparison to alkali-bearing cement (with a content of alkali-silicate-aluminate) in relation to the procedure of set and increase in strength in water and air storage, and also to gypsum action, would be not only of scientific but also of practical interest.—*Zement*, vol. 29, no. 23 (June 6, 1940) pp. 283-287.

Aggregates and Heat Expansion of Concrete

F. Keil and H. G. Tempel report from the research institute of the Association of German Iron Portland Cement Works on the influence of certain German aggregate materials and their age on the heat expansion of concrete. A normal cement was used in the tests and the aggregates used included Rhine sand, Rhine gravel, Piesberg sandstone, blast-furnace lump slag, granite, diabase, basalt and limestone, and also de-aërated and non-de-aërated pumice gravel. The concrete specimens were made of 1 part cement, 3 parts Rhine sand, 3 parts aggregate, and ½ part water. The

heat-expansion figure of the specimens was obtained after 90-day water storage and 90-day mixed storage in starting temperatures of 5 to 10, and maximum temperatures of 40 to 45 degrees C.

The heat-expansion figure was highest for concrete made of Rhine gravel, lump slag and Piesberg sandstone, lower for the tested eruptive rocks, such as granite, diabase, basalt and coarse basalt, and lowest for concrete made of limestone. Concrete, whose fine and coarse aggregate consisted of siliceous rock, had after 90 days' water storage about the same heat expansion as the siliceous rock. When the coarse portion, 7 to 25 mm., of the aggregate was displaced by rock having lower heat expansion, the heat expansion of the concrete decreased also, but not in a proportionate relation, since in the concrete specimens the influence of the hydrated cement is also expressed. The heat-expansion figure of 7- and 28-day concrete was distinctly lower. Concrete specimens containing rough basalt and diabase stored dry in a room, and even more those containing pumice gravel, had after three months greater heat-expansion figures. These figures were in the range of the heat-expansion figures for quartz-bearing rock and lump slag. The rough basalt is designated as a rock with a higher pore content; the diabase as a rock with greater quantities of constitution water. The not de-aërated pumice gravel and, therefore, the one permeated with more pores, had higher values in water storage as well as in mixed storage.

These differences justify the conclusion that the heat expansion of the aggregate is decisive for the heat-expansion figure in water storage; but that in dry storage the state of drying out, that is, the content of air pores and obviously the water fixation, also plays an essential part. Since concrete stored outdoors does not dry out as much as that stored in a room, the heat-expansion values of street-paving concrete made with rough basalt and diabase are certainly not as remote from the heat-expansion values of the water-stored concrete as indicated in the laboratory tests.

In cases where a low heat-expansion figure is valued the use of limestone for aggregate should be advantageous. The heat expansion of concrete made with limestone was only 70 to 80 per cent. of that of concrete made with Rhine gravel. This verifies the favorable experience which has been had with street-paving concrete in foreign countries. Under identical conditions there appear two to two and one-half times the number of cracks in concrete surfaces made with quartz gravel as in concrete surfaces made with crushed limestone. However, limestones of various sources and hardness can behave differently. A consideration of the drying-out condition of the concrete and the porosity of the aggregate will help in clearing up the differences in results. —*Zement*, vol. 29, no. 20 (May 16, 1940), pp. 248-253.

Development of American Portland-Cement Industry

Dr. Rudolf Willmek lists five factors which combined were of decisive importance in the great advance of the Portland-cement industry in the United States: (1) systematic chemical investigation; (2) the production of suitable grinding plants; (3) the introduction of the rotary kiln; (4) the establishment of standards; and (5) study concerning the best application of concrete and the best methods for its production. In describing the Portland Cement Association in Chicago, he mentions that it does not have the character of a cartel, that it is one of the greatest technical scientific or research organizations in the world, and that its members include

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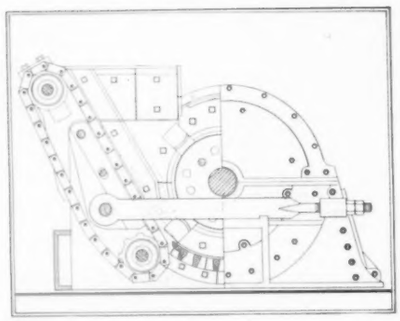

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not only most of the American cement firms, but also those of Canada, Mexico, Cuba, Argentine, and Uruguay.—*Zement,* vol. 30, no. 12 (March 20, 1941), pp. 165-166.

Burning of Caustic Magnesia Is Studied

Rudolf Zollinger and Richard Huppertsberg report from a building-materials research laboratory on the burning of caustic magnesia in a rotary kiln, and conclude from the experiments that the quality of the product of the burning depends on the temperature of the burning, the duration of the burning, and the particle condition of the burning. The finer particle is more sensitive to an extended duration of burning and is calcined comparatively more intensely than the coarser particle. But during shorter duration of burning the finer particle holds the carbonic acid longer than the coarser particle, which is probably due to the more dense placement of the fine material which requires a certain amount of time for complete penetration of the heating gases. Again, the finer particles are more easily calcined to their interiors than the coarser particles, so that no schematic general rule can be established.

It can be stated in general that an increase in temperature at the same duration of burning effects first of all an increase in the quality of the burned product up to a maximum, whereas an increase in temperature beyond this maximum point is equal to a quality impairment due to over-burning. The point where the maximum is reached is far-reaching, dependent upon the particle size of the burned material. In order to equalize the dependence upon particle sizes the extension or shortening of the duration of burning, and consequently the action time of the temperature, is a good aid.

These conditions make the rotary kiln appear more favorable for magnesia burning than the shaft kiln, since only in a rotary kiln is it possible to adjust for particle size, temperature, and duration of burning. Adjustments in the burning can be made by selecting different kiln diameters, varying the kiln rotation, and extending the kiln length.—*Zement,* vol. 29, no. 38 (September 19, 1940), pp. 481-486; no. 39, pp. 493-495.

Film Shows Long Conveyor

"Golden Valley," a 16mm. sound-picture record of the Shasta Dam 10-mile conveyor belt manufactured and built by the Goodyear Tire & Rubber Company, was distributed nationally in July. The schedule calls for showings in over 250 cities from coast to coast.

OCCUPATIONAL DISEASES and the LAW

Limitations

American Radiator & Standard Sanitary Corporation v. Hayden et al., decided by the Court of Appeals of Kentucky, March 11, 1941; reported at 149 S.W. (2d) 6.

In 1934 the legislature of Kentucky adopted some amendments to the Workmen's Compensation Act relating to silicosis (Chapter 89, Acts of 1934), among which is a provision (Section 4914) that an application for compensation must be made within one year after the last injurious exposure to silica dust. The court herein rules that this limits an injured employee but not a dependent of such an employee, and that under the general provisions of the act a dependent of a workman who died from silicosis may file a claim within a year after such death. The employee concerned quit work on December 22, 1936, and by agreement of the parties was paid the amount of maximum compensation. He died of silicosis on June 3, 1938. His widow filed a claim for compensation on May 31, 1939, and that claim is allowed under the statute.

Bronchiectasis

Hirst v. Chevrolet-Muncie Division of General Motors Corporation, decided by the Appellate Court of Indiana, in banc, May 5, 1941; reported at 33 N.E. (2d) 773.

A workman's claim for compensation under the Indiana Workman's Occupational Disease Act (Acts 1937, Chapter 69) for disablement from bronchiectasis allegedly caused by fumes and dust inhaled in the course of his employment was denied by the Industrial Board, which decided that the plaintiff's disability was not the result of any occupational disease arising out of and in the course of his employment. That decision, however, is reversed by the court, which finds that the evidence furnishes substantial proof that the disease arose out of and in the course of the employment.

The employer contended that the case did not come within the purview of the act because the disease was contracted before the act went into effect. To this the court replies that the act "provides for compensation for disabili-

ties from occupational diseases and not for contracting such diseases," and that since the workman became disabled after the act went into effect, compensation may not be denied on jurisdictional grounds.

LABOR DECISIONS

Hearing

National Labor Relations Board v. Prettyman et al., decided by the U. S. Circuit Court of Appeals, Sixth Circuit, February 13, 1941; reported at 117 Fed. (2d) 786.

The National Labor Relations Board issued a notice of a hearing on a complaint involving the respondent company, to be held at Ann Arbor, Michigan. The company obtained from the Michigan Supreme Court a temporary injunction, claiming that its operations (printing) were entirely intrastate and not under the jurisdiction of the Board. Thereupon the Board began a new proceeding and ordered a hearing at Washington. In that proceeding a cease-and-desist order was issued against the employer, which in this appeal contested the order on the ground that it was unfair to hold the hearing at such a distance from it that it could not make an adequate defense. On that ground the Court refuses to enforce the Board's order, holding that "fair play, under the statute, required the Board to hold a hearing at a place convenient to each of the parties." The decision does not prejudice the right of the Board to hold another hearing at Ann Arbor.

The Court also holds that the employer's printing activities constitute interstate commerce subject to the Board's jurisdiction, and that an amicable settlement of the differences between the employer and the complaining union does not require dismissal of the proceedings, which is within the discretion of the Board.

Refusing to Hire

F. W. Poe Manufacturing Company v. National Labor Relations Board, decided by the U. S. Circuit Court of Appeals, Fourth Circuit, April 7, 1941; reported at 119 Fed. (2d) 45.

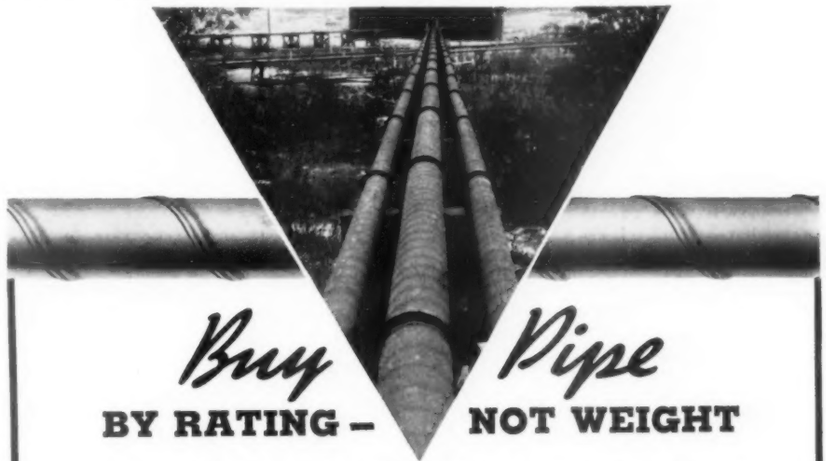
An employee involved in this case was laid off because of the installation of additional equipment, and did not get further employment because he failed to appear on the "spare floor" where additional employees were selected from day to day. He filed charges with the National Labor Relations Board that he had been discriminatorily discharged because of his union activities. The board found the charge was not supported by the facts, but did hold that the employer had subsequently refused to rehire the employee because of his filing the charges. In this appeal the court rules that even that finding of the board is not supported by the evidence, but merely upon a supposition. The National Labor Relations Act, says the court, "does not seek to prohibit evil intent but unfair labor practices, and there was no substantial evidence of such a practice in this case".

Bargaining Unit

Pittsburgh Plate Glass Company v. National Labor Relations Board and *Crystal City Glass Workers' Union v. Same,* decided by the U. S. Supreme Court, April 28, 1941; reported at 61 S. Ct. 908 (affirming 113 Fed. (2d) 698).

The National Labor Relations Board determined that the appropriate bargaining unit for production and maintenance employees at the Pittsburgh Plate Glass Company's Crystal City, Missouri, plant was the production and maintenance employees of all six plants in the company's flat-glass division rather than the Crystal City employees only. That ruling is sustained in this proceeding, even though an organization of Crystal City employees had been formed for the purpose of collective bargaining. "It is true," says the court, "the record shows a substantial degree of local autonomy. Crystal City is a separate industrial unit, not one mechanically integrated into the division. The local superintendent deals with labor grievances, the plant has its own purchasing agent and there is no exchange of employees. On the other hand, labor policies and wages come from the central office in Pittsburgh, there is a great similarity in the class of work done. Wages, hours, working conditions, manufacturing processes differ only slightly among the plants. An independent unit at Crystal City, the board was justified in finding, would frustrate division-wide effort at labor adjustments. It would enable the employer to use the plant there for continuous operation in case of stoppage of labor at the other plants. We are of the views that there was adequate evidence to support the conclusion that the bargaining unit should be division-wide."

It is likewise held that the board was not in error in refusing to hear certain testimony (such as that intended to show that the Crystal City employees' organization was not dominated by the employer), and that the act as applied in the case is not unconstitutional.



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Interstate Commerce

Fleming, Administrator, etc. v. A. B. Kirschbaum Company, decided by the U. S. District Court, Eastern District of Pennsylvania, April 2, 1941; reported at 38 Fed. Supp. 204; and

Fleming, Administrator, etc., v. Arsenal Building Corporation et al., decided by the U. S. District Court, Southern District of New York, April 11, 1941; reported at 38 Fed. Supp. 207.

These cases involve very similar facts but the judges reach entirely different conclusions. In each case, the employer is the operator of a building housing tenants who are engaged in the manufacture of goods for interstate commerce, and the employees are service employees occupied in operating and maintaining the building. In the *Kirschbaum* case the court holds that the employer must comply with the Fair Labor Standards Act of 1938; in the *Arsenal* case the court rules that the employer is not subject to the act.

The essential ruling in the *Kirschbaum* decision is that it is the nature of an employee's occupation which determines whether or not the employer is subject to the Fair Labor Standards Act of 1938 with respect to that employee. The renting of buildings is not an industry engaged in interstate commerce or in the production of goods for interstate commerce; but that, says the court, is not the determining factor. The employees involved in the case were elevator operators, firemen, an engineer, watchmen, carpenters and a porter who serviced a building occupied by tenants who are engaged in interstate commerce. The activities of these employees were held to be "necessary for the production of the goods intended for interstate commerce manufactured by the tenants of the building," and the employer was required (by injunction) to comply with the Fair Labor Standards with respect to them. It was also held that the employer is not within the exception granted to "service establishments."

In the *Arsenal* case, the court in the Southern District of New York holds that "the limits of Federal jurisdiction under the Fair Labor Standards Act are extended only to employees 'engaged in Commerce or the production of goods for commerce'," in which "Commerce" means, essentially, interstate commerce; that the Congress intended the ambit of the Fair Labor Standards Act to be narrower than the ambit of the National Labor Relations Act, where the words "affecting commerce" are used; and that these service and maintenance employees are not covered by the act. Also contrary to the ruling in the other district, the court holds that the employer would be entitled to the exemption of "service establishments."

Bias

National Labor Relations Board v. Washington Dehydrated Food Company, decided by the U. S. Circuit Court of Appeals, April 9, 1941; reported at 118 Fed. (2d) 980.

The National Labor Relations Board ordered the employer in this case to reinstate two employees which it found had been discharged on account of their union activities, while the employer maintained that they had been discharged for drunkenness and incompetence. The court finds from the record that the board's trial examiner deprived the employer of a fair trial by his bias against it and conduct more in the *rôle* of a prosecutor than impartial examiner." The order is set aside and remanded for a hearing before a different examiner.

Strike

National Labor Relations Board v. Highland Shoe, Inc., decided by the U. S. Circuit Court of Appeals, First Circuit, April 15, 1941; reported at 119 Fed. (2d) 219.

A contract between the employer concerned in this case and a union representing its employees provided that the contract would be terminated if a strike occurred. After trying unsuccessfully to get the union to agree to a wage reduction, the employer closed the plant, and later reopened it after the employees had voted to accept the reduction. After further negotiations with the union, a strike (which the board found was instigated by the employer) occurred, and the employer refused to negotiate further with the union.

The court supports the board in its finding that the employer violated the National Labor Relations Act by negotiating directly with its employees and refusing to bargain with the union. Even if the strike was not instigated by the employer and the contract was terminated by its own terms, it was still the statutory duty of the employer to negotiate with the employees' bargaining agent. The claim that the board's order to bargain with the union should not be enforced because at the time of the board's hearing the union did not represent a majority of the employees is answered by various Supreme Court decisions holding that an employer may not take advantage of its own unfair labor practices which have undermined the prestige of the union, and the question of a redetermination of the bargaining agent is left to the board.

Overtime Pay

St. John et al. v. Brown et al., decided by the U. S. District Court, Northern District of Texas, Fort Worth Division, March 28, 1941; reported at 38 Fed. Supp. 385.

The principal question for decision in this suit was the application of the overtime requirement of "one and one-half times the regular rate," in the Fair Labor Standards Act of 1938. In the case of an employee who was hired at $100 per month for a work week of 63 hours, the employer argued that the requirements of the act were met because that pay could be allocated so as to cover the statutory minimum wage for the statutory maximum hours and, in addition, one-and-a-half for all overtime. The court rules that such a computation does not satisfy the statutory requirement because "the parties in contracting did not intend that any of the nine hours in a day's work would be paid for at a different rate from any other hour." The $100 per month is reduced to a rate of 36.6 cent per hour straight through the 63 hours per week, and for each of the 21 hours of overtime, the employee is entitled to recover an additional 18.3 cent.

The court points out that "this is a harsh and unjust judgment" and "a severe penalty for inability to understand a law about which the lawyers of the country, and the judges as well, are sincerely differing," but that injustices resulting from application of the law are matters for the Congress.

Jurisdiction

In re Abbott's Dairies, Inc., decided by the Supreme Court of Pennsylvania, March 24, 1941; reported at 19 Atl. (2d) 128.

This case involves a dispute between a union and a dairy company. The same matter was formerly presented to the National Labor Relations Board, which dismissed the proceedings without assigning a reason for its action. When presented to the Pennsylvania Labor Relations Board, that board decided that it had jurisdiction; in that decision it was upheld by a lower court, which assumed that the National Board dismissed the proceedings because it did not have jurisdiction. However, the State Supreme Court finds from an examination of the facts that interstate commerce is involved, and that under the Pennsylvania Labor Relations Act of June 1, 1937, the Pennsylvania Board has no jurisdiction if the dispute affects interstate commerce. Even if the National Board dismissed on the conclusion that it had no jurisdiction, that fact would not give jurisdiction to the State Board under the facts presented.

Injunction

International Association of Bridge Structural & Ornamental Iron Workers et al v. Pauly Jail Building Company et al., decided by the U. S. Circuit

Court of Appeals, Eighth Circuit, April 1, 1941; reported at 118 Fed. (2d) 615.

The District Court granted an employer an injunction against a union, forbidding the union to represent that the employer was unfair in refusing to enter into an agreement, to advise or solicit anyone not to work for or install products of the employer, etc. That court held that the representations constituted "fraud," so that an injunction was permissible under the Norris-La Guardia Act of March 23, 1932, 47 Stat. 70, 29 U.S.C.A. §§101-115. That decision, however, is reversed by the appellate court, which holds that no fraud was involved because the employer, during the period concerned, dealt with the union as the proper bargaining agent of its employees and never questioned its authority to act in that capacity, and there is no contention that the union deceived the company in the situation. The lower court is therefore directed to dismiss the action.

Desist Order

National Labor Relations Board v. Reed & Prince Manufacturing Company, decided by the U. S. Circuit Court of Appeals, First Circuit, April 2, 1941; reported at 118 Fed. (2d) 874.

In this case an employer contested a cease-and-desist order of the National Labor Relations Board on the ground, among others, that the strike was "illegal", so that the employer was under no obligation to bargain with the union representing the employees. The court holds, however, that the striking employees remained "employees" for the purposes of the act, and that the employer was under an obligation to negotiate with the collective-bargaining agent representing them. Many of the strikers were taken back to work, in a "back-to-work" movement, upon the signing of agreements not to request a closed-shop of the check-off system. Such agreements, says the court, were illegal, and the board was correct in ordering the employer not to enforce such contracts. When the strikers generally were rehired, four were not hired; this, it is decided, constituted a discharge of those four, and the circumstances show discrimination against union workers, so that the board's order of reinstatement was appropriate. The anti-union propaganda found to have violated the act was ordered discontinued, which the court holds not to have violated the principle of "free speech". A broad order for the employer to cease and desist from in any manner interfering with, etc., the employees' rights guaranteed by Section 7 of the act is held to be justified by the fact that three unfair labor practices were shown to have been engaged in.

TRAFFIC News Digest

I.C.C. Decisions

Lime—Fourth-section application No. 18488, lime from the southwest to the south. Heard by Examiner J. P. McGrath. Recommends a grant of authority, on conditions, to establish and maintain rates on lime from producing points in Arkansas, Kansas, Oklahoma, Louisiana, Texas, and southwestern Missouri to destinations in southern territory, including Memphis, Tenn., and Mississippi River crossings south thereof, except destinations in southern Florida, and from producing points in eastern Missouri to the aforesaid destinations except the river crossings, as to which temporary relief was given by F.S.O. 13907, without observing the long-and-short-haul part of the fourth section.

Cement—Fourth-section application No. 18271. Cement to Plymouth, North Carolina. The Atlantic Coast Line authorized by F.S.O. 14292, on conditions, to establish and maintain a rate not lower than 9 cents on cement, hydraulic, natural or portland, concrete mix or concrete mixture, masonry cement, and mortar cement or dry building mortar, from Norfolk, Pinners Point, and Portsmouth, Virginia, to Plymouth, North Carolina, as to which temporary relief was given by F.S.O. 13752, as amended, without observing the long-and-short-haul part of the fourth section.

Sand—Docket 28596. Continental Roll & Steel Foundry Company *vs.* Wheeling & Lake Erie R.R. Report by Commissioner Mahaffie. The rates charged of $1.20 on shipments moved between March 12 and October 12, 1937, and $1.32 on shipments moved between October 9, 1939, and February 28, 1941, on sand, from Dundee, Ohio, to Wheeling, West Virginia, found unreasonable to the extent that the former exceeded $1.00 prior to December 20, 1937, and the latter, in effect since April 14, 1938, exceeded, exceeds, or might exceed $1.10. Reparation, with interest, was awarded.

Sand and Gravel—Docket No. 28476. Thornton Quarries Corporation *vs.* Chicago & Eastern Illinois *et al.* Report by Commissioner Alldredge. Rates on sand and gravel from Dickason, Indiana, to Champaign and Urbana, Illinois, not unlawful, except that rates assailed were and for the future would be unduly prejudicial to complainant and unduly preferential of shippers at At-

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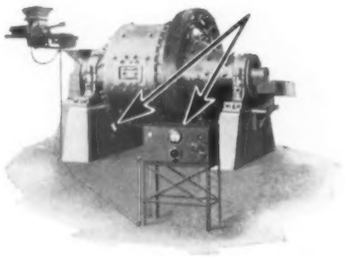

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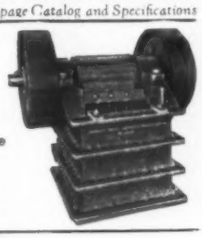

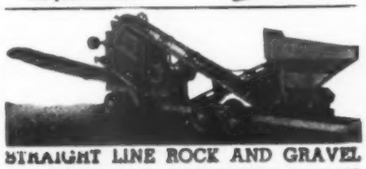

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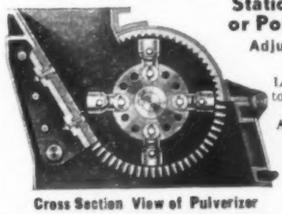

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tica, Kern, and Terre Haute, Indiana, to the extent that the rate on sand from Dickason in connection with the New York Central or Wabash exceeded or might exceed the single-line rates from Kern and Attica by more than 22 cents and the single-line rate from Terre Haute by more than 11 cents, that were, or hereafter might be, concurrently maintained. The undue prejudice is to be removed and rates which will prevent and avoid the undue prejudice are to be established on or before October 9.

Cement—Docket No. 28595. Louisville Cement Company *vs.* Pennsylvania *et al.* By Examiner Morris H. Konigsberg. Rates on cement from Speed, Indiana, to points in Virginia on and north of the Norfolk & Western, unreasonable to the extent that they exceed or might exceed those made 114 per cent. of the rates prescribed in Atlas Portland Cement Company *vs.* Chicago, Burlington & Quincy, 81 I.C.C. 1, subject to general increases subsequently authorized. Complainant alleged that the rates were and would be unreasonable, unduly preferential of its competitors in Central Freight Association and Trunk-Line territories and in the Birmingham district, and unjustly discriminatory or unduly prejudicial against it, and asked prescription of lawful rates for the future. It was said by the examiner that establishment of rates on the basis found by him to be reasonable for the future would remove any undue prejudice to complainant and undue preference to competing shippers in Central and Trunk-Line territories.

Motor Proposed Reports

Belle Fourche, South Dakota. MC 102192. Robert A. Jeremiason and Hans B. Jeremiason, Jeremiason Construction Company, contract-carrier application. Joint board 183. Permit proposed. Bentonite, points in Crook county, Wyoming, to Belle Fourche, and return.

Driggs, Idaho. MC 101392. Floyd Frederick Higbee, contract-carrier application, embracing MC 101393, Lester Denton, contract-carrier application, and MC 101394, Hyrum E. Hall, contract carrier application. Joint board 29. On further proceedings, permits proposed for applicants; lime rock, in bulk, from Fox Creek Quarry, Wyoming, to Fox Creek Siding (on the Union Pacific 5 miles south of Driggs, Idaho, over a specified route, with no transportation for compensation in reverse direction, in the season from May 1 to October 31 of each year. Thirty days for exceptions.

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Pedro, Ohio. MC 101784. Thos. J. McClain, contract carrier application. Joint board 37. Permit recommended. Ferro-calcite, roasted, Lawrence, Ohio to Ashland, Ky.

Mount Airy, North Carolina. MC 102405. Emmitt F. Golden, common carrier application. Examiner W. W. McCaslin. Denial proposed. Agricultural lime, in bulk, Austinville, Virginia, to points in Surry County, North Carolina.

4th-Section Applications

Docket 19133 (Amended notice)—Filed by the C. & N. W. requesting fourth section relief to establish rates on sand and gravel, carloads, from South Beloit, Illinois, to Camp McCoy, Wisconsin, to meet market competition. Schedule filed containing proposed rates C. & N. W. I.C.C. 10823.

Docket 19144—Filed by the C. M. St. P. & P. requesting fourth section relief to establish rates on sand and gravel, carloads, from Beloit, Wisconsin and South Beloit, Illinois, to Camp McCoy, Wisconsin, to meet carrier and market competition. Schedule filed containing proposed rates C. M. St. P. & P. I.C.C. B 7267.

Docket 19150—Filed by B. T. Jones requesting fourth-section relief to establish rates on cement, common, hydraulic, masonry mortar, natural or portland, carloads, from points in Illinois, Indiana, Ohio and Pennsylvania to points in New England Territory. Carrier competition. To apply over short tariff routes. Rates constructed on the basis of the short line distance formula and additional routes being grounds for relief. Schedule filed containing proposed rates B. T. Jones I.C.C. 3406, Supplement 14.

Docket 19151—Filed by W. S. Mercer requesting fourth-section relief to establish rates on gravel, carloads, from LaGrange, Missouri to Vermont, Illinois. Market and wayside pit competition being the grounds for relief.

Docket 19158—Filed by J. R. Peel requesting fourth-section relief to establish rates on lime, carloads, from points in Arkansas, Oklahoma, Illinois, Kansas, Louisiana, and Missouri to points in Texas. Circuitous routes being the grounds for relief.

Docket 19170—Filed by the Missouri Kansas Texas R. R. requesting fourth section relief to establish rates on sand, gravel, coal, cinders, crushed stone, chat, chat sand, and riprap, carloads, from points in Kansas, Oklahoma, and Missouri to stations on the Missouri Kansas Texas and the Beaver Meade and Englewood. Circuitous routes being the grounds for relief.

Docket 67498 (Carrier's proposal)—Limestone, ground or pulverized, carload. Cancel export rate on, from Rate

WORLD'S LARGEST KILNS—AND A CLEAN STACK
PERMANENTE REPEATS AGAIN . . .
No Nuisance—No Losses...
Making 11,000 barrels of cement a day without dust or fume loss establishes a new performance record for Cottrell Electrical Precipitators at Permanente.
Dust collected in the hoppers of the Precipitator is carried by screw conveyors to the kiln feed house to be returned to the kiln feed or to storage.
Where the high overall efficiencies on dust and fume possible with Cottrell Electrical Precipitators are not necessarily required, Western Precipitation Corporation offers a range of Multiclone equipment which, in combination with Impax Separators, will provide for the classification of the recovered dust and give any desired recovery except for the very fine dust and fume.
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ELECTRICAL PRECIPITATORS
Write for your copy of this interesting book today
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1015 West Ninth Street, Los Angeles, California • 405 Lexington Avenue, New York
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PRECIPITATION COMPANY OF CANADA, LTD.
Dominion Square Building, Montreal • Pioneers in Dust and Fume Control

. . . WITH AN ORDER FOR A NEW COTTRELL TO TAKE CARE OF A 33⅓% INCREASE IN KILN CAPACITY

The above advertisement appeared in the January, 1941, issue of PIT & QUARRY. Since that time Permanente has added a new kiln, raising production 33⅓ per cent, and a new Western Precipitation Cottrell to take care of this increase. ¶ In 1940 over 40 per cent of all orders received by Western Precipitation Corporation were repeat business. No greater vote of confidence could be expressed by the owners of Western Precipitation Cottrell Electrical Precipitators.

IT COSTS NO MORE

TO USE THE BEST

REPLACE WITH
"Indian Brand"
MANGANESE STEEL
LONG LIFE
ABRASION
RESISTING PARTS
FOR
QUARRY, ROAD,
DREDGING,
AND
MINING MACHINERY

The Frog, Switch & Mfg. Co. CARLISLE, PA.

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NEW HOLLAND
Vibrating Screen

CIRCLE NH THROW

This is the "Circle Throw" SCREEN that puts your grading on a "total production" basis at new low costs. A full range of sizes with one to three decks.

The New Holland Line:

Crushers, Pulverizers, Elevators, Screens, Conveyors, Belting, Engines, Furnaces, V-Belt Drives, Feed Mills, Electric Motors, Concrete Mixers, Dewaterers, Semi-Steel Castings, Gray Iron Castings, Power Mowers
Pick-up Bailing Presses

Ask for Bulletins

NEW HOLLAND MACHINE CO.
New Holland (Lancaster County) Pennsylvania

Groups 6600 to 6615, Youngstown, Ohio, representative, to Newport News and Norfolk, Virginia, published in Item 23870, C.F.A.L. Tariff 218M, and similar rate in individual lines tariffs, account obsolete.

Docket 67472 (Shipper's proposal)—Stone, crushed, in bulk, in open-top cars, and screenings, crushed stone, in bulk, in open-top cars, carloads. Establish on, from Luckey, Ohio to Erie, Pennsylvania, at rate of $1.65 per net ton, via the N.Y.C. direct.

Docket 67516 (Carrier's proposal)—Clay, crude, not crushed, ground or processed, carload, minimum weight 90 per cent. of the marked capacity of the car. Establish a rate of $3.96 per net ton from St. Louis to Dover, Ohio.

Docket 67768 (Shipper's proposal)—Limestone, agricultural, unburned, not ground or pulverized, in bulk, in open-top cars only, carload. Establish rate of $1.38 per net ton from Narlo, Ohio, to Beloit and Garfield, Ohio.

Docket 67799 (Shipper's proposal)—Sand, all kinds, and gravel, in open top cars, carload. Establish rates from Chardon, Ohio to Bucyrus, Ohio of $1.38 per net ton and $1.60 per net ton to Columbus, Ohio.

Docket 67829—(Shipper's proposal)—Agricultural limestone, unburned, in open-top cars, carloads. Establish rates on, from Sandusky, Ohio to Kimbolton, Ohio $1.38; Byesville, Cambridge, Pleasant City, Ohio $1.49; Caldwell, Ohio, $1.60 per net ton. All *via* the P. R. R. direct.

Docket 67830 (Shipper's proposal)—Agricultural limestone, unburned, in open-top cars, carload. Establish a rate of $1.49 per net ton from Marion, Ohio to Cadiz, Ohio, *via* the P. R. R. direct.

Docket 67839 (Shipper's proposal)—Cement, common, hydraulic, masonry, natural or Portland, carload. Minimum weight 50,000 pounds, except when the marked capacity of the car is less, in which event the marked weight capacity of the car will be the minimum weight, but the minimum weight is to be not less than forty thousand pounds. Establish a rate of 16 cents from Kenova, West Virginia, to Louisville, Kentucky via the B. & O. direct and *via* the B. & O., Cincinnati, and the L. & N.

Docket 67902 (Shipper's proposal)—Sand, except naturally bonded molding, ground or pulverized sand, in closed equipment without tarpaulin or other protective covering, carload. Establish a rate of 77 cents per net ton from Lock No. 3 Pennsylvania to Neville, Island, Pennsylvania *via* the P. & L. E. R. R.

Docket 67907 (Shipper's proposal)—Agricultural limestone, unburned, in open top cars, carload. Establish a rate of $1.38 per net ton from Sandusky, Ohio to Broadacre, Ohio *via* the P. R. R. direct.

Docket 67886 (Carrier's proposal)—Cement, carload. Cancel the rate of 14 cents from Kenova, West Virginia, to Maysville, Kentucky, published in B. & O. Tariff I.C.C. 23287, *via* B. & O.-Louisville-L. & N. Classification basis to apply.

Docket 67902 (Shipper's proposal)—Clay, crude, common or fire, not ground, in bulk, carload. Minimum weight 90 per cent. of the marked capacity of the car. Establish a rate of $1.46 per net ton from Eifort, Ohio to Olive Hill, Kentucky.

NEW MACHINERY and SUPPLIES

● Shock-Absorbing Belt

The latest development of the Republic Rubber Division is a newly patented (No. 2,237,173) belt construction, known as Shock-Absorber conveyor belting.

The major departure from conventional design is a specially-compounded layer of soft, resilient, cushioning rubber interposed between

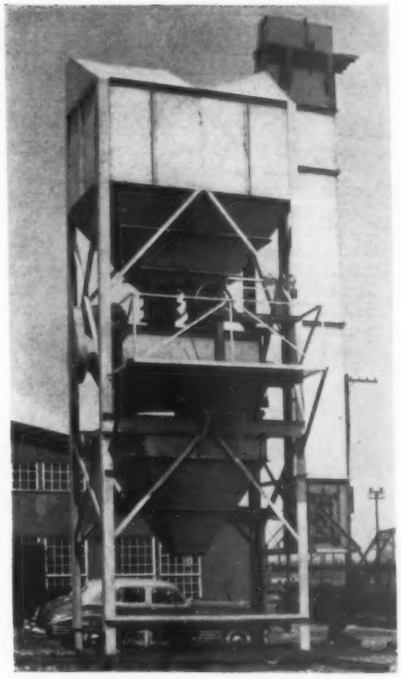
Section of the new belt showing its "shock absorber" construction.

the comparatively stiff, abrasion-resisting cover and the hard fabric body of the belt. The force of excessive impact and shock from falling rock, ore, or other heavy lump material at the loading point is harmlessly spread and dissipated by this "cushion." The damaging effect of this punishing force, closely localized in standard belting, is thus overcome. As a result, the new Republic Shock-Absorber conveyor belt has proved, under extensive tests and actual installations, capable of vastly increased service life.

● Mortar-Mixing Plant

Due to the rapidly increasing use of ready-mixed mortar by the building trades there has recently come on the market a mortar-mixing plant built as a complete unit of a size that can be shipped complete on one flat car.

Known as the Unit-Built plant, it has a capacity of about three tons per hour of finished product and the plant is shipped complete with the exception of the packer which can be either the single or two-tube type. There are two bulk-material bins, one for hydrated lime (or fine limestone dust) and the other for bulk cement. These bins discharge through two non-dribble rotary valves to a 2,000-pound capacity heavy-duty batch mixer on which is mounted the operat-



The mortar-mixing plant.

ing motor. After the material is measured into the batch mixer by means of suspension-bearing pipe-lever scale on which it is mounted, the mixer is then operated about 15 minutes. The mixture is then discharged into the check, or packer, bin.

The bulk-material bins consist of a hydrated lime (or fine limestone dust) bin of 225 cubic feet capacity which is fed by an elevator that is standard equipment with the plant. This elevator receives its material from bin in the usual plant and delivers it to the mortax-mix plant surge bin. This bin is partitioned off from the bulk-cement bin which has a capacity of 250 cubic feet and may be fed by the same elevator that handles the hydrated lime or other means depending on local requirements. The check or packer bin has a capacity of 125 cubic feet and has a discharge flange ready to receive packer.

The total height of the unit is 31 feet and it requires a floor space of only 6 by 10 feet, which is the size of the rectangular bins. The plant includes an operating platform which sets high on the side of the unit and does not take up any floor space.

The Unit Built plant is of electric-welded construction and amply braced. The elevator is inclosed and the discharge from the two rotary valves and the mixer is through canvas spouts thus making the complete operation dustless.

Only about 15 horsepower is required to operate the complete plant, 10 horsepower for the mixer, 3 horsepower for the packer and from 1½ to 3 horsepower for the elevator.

The plant was designed by Harry L. St. Clair, chief engineer, Southern Machinery & Supply Company, of Roanoke, Virginia, distributors for the United States and Canada. Steel work and erection has been done by the C. L. Fielder Company, also of Roanoke.

• Portable Plant

Highways, airports, cantonments, munitions plants and many other defense projects have created a demand for equipment that would provide fast delivery of thousands of tons of aggregates at low cost. To meet this demand, the Iowa Manufacturing Company designed and built the "Morok." With a capacity of 150 to 200 tons per hour, the "Morok" produces material in a continuous flow from quarried rock to delivery trucks in one operation.

The portable crushing-and-screening plant set up at the job.

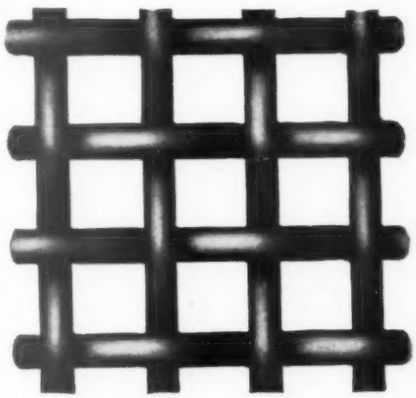
This plant is built in three major units, each unit mounted on pneumatic-tired trucks for easy transporting and fast setting-up. The primary unit with its heavy-duty rock feeder and 2540 jaw crusher handles rock direct from the quarry. A belt-conveyor takes the crushed material from the primary unit to the secondary plant. This unit is equipped with a 4024 roller-bearing roll-crusher, a 1036 secondary jaw crusher and a 48-inch by 12-foot horizontal vibrating screen. Aggregate from the secondary plant is conveyed to the bin unit, where a second 48-inch by 12-foot screen does the final grading over the 40-cubic yard compartment bin. The bin compartments have gates for discharging to trucks. The bin unit is equipped with a raising and lowering device for erecting and dismantling and a special steel frame truck for transporting.

The complete portability of the plant reduces the cost of moving to the job, erecting and dismantling. Portability makes the plant adaptable and flexible in its operation, allowing separate use of the three units when desired and allowing a greater range of jobs it will handle economically.

Power may be all electric or a combination of Diesel plus electric. The all-electric plant has separate motors for all crushers, screens and conveyors, supplied by either a generator or high-lines. In the combination power arrangement, Diesel engines operate the three crushers, and electric motors are used for screens and conveyors. A small generator set is required to supply electricity to the electric motors.

Bulletin SRP-1 giving complete details concerning the Morok plant will be sent upon request to the Iowa Manufacturing Company, Cedar Rapids, Iowa.

ROEBLING
ABRASO
SCREEN
TRADE JERSEY MARK



ROEBLING STEEL
Assures Long Life

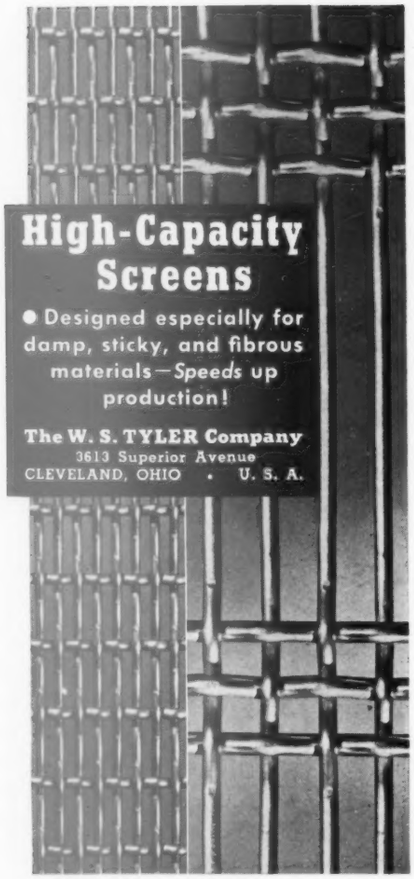
Roebling "Abraso" Screening is made of special steel—manufactured by *custom methods* in Roebling's own mill. It is steel that offers maximum resistance to the BEATING of stone and gravel.

To further assure long screening life, Roebling controls every step of manufacture from steel making to fabrication.

Roebling "Abraso" Screening is available for every sizing, cleaning and grading service.

JOHN A. ROEBLING'S SONS COMPANY TRENTON NEW JERSEY

Branches in Principal Cities Export Division: 19 Rector St., New York, N.Y., U.S.A. Cable Address: "Roebling's", New York


High-Capacity Screens
● Designed especially for damp, sticky, and fibrous materials—Speeds up production!
The W. S. TYLER Company
3613 Superior Avenue
CLEVELAND, OHIO • U. S. A.

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service.

EARLE C. BACON, Inc.
17 John St. New York, N. Y.

● Welded Dipper

A number of significant features have been incorporated in the new P&H 1½-cubic yard all-welded dipper announced by the Harnischfeger Corporation of Milwaukee for its Model 655-A hydraulic excavator.

Besides stability gained by the welded construction, there are the advantages of a renewable manganese lip, renewable dipper teeth, and improvements in the latching mechanism. By providing a heavy shell—simplicity of reinforcements and an exceedingly sturdy padlock frame with large sheave, a maximum in overall strength and rigidity has been secured. Also important is the absence of corner welds—a feature achieved by forming the dipper back of the parent metal instead of the inserted-plate-type back.

New all-welded dipper.

● Bag Closure

Rip-Cord Closure, a new method of closing fabric bags so that they can be opened quickly and easily without tools and without injury to the bag has been developed by the Fidelity Machine Company, Philadelphia, for the Bag Closure Corporation. The Fidelity Machine Company is now manufacturing this machinery under exclusive license. The Union Special Machine Company makes the sewing machine, pulley, clutch, and motor. Feeder table, sewing conveyor, automatic stacker, automatic cutting knife, etc., are made by Fidelity Machine Company.

Unfilled bags are fed into the sewing head on an automatic conveyor which is accurately synchronized with the speed of the sewing machine. The bags are automatically counted and a bell is rung as every fiftieth bag is completed. An automatic cutter trims the ends of the ripcords—allowing 3 to 5 inches to serve as a hand hold for opening. Discharge conveyor operates independently at approximately four times greater speed. From this conveyor, bags are automatically stacked on a receiving table.

Bags which are closed before filling are filled through a self-sealing slot at the bottom of bag. Bags to be closed after filling are fed through sewing head by means of special conveyor.

Among the many advantages claimed for this type of closure by makers and users, is the high speed of closure. Rip-Cord Closure can be applied to over 1,000 bags per hour. Bags can be opened quickly and easily without tools and without injury to bag, permitting re-use. Partial opening forms handy pouring spout when needed.

Paper strips, serving as identification and aiding in opening, can be attached in same operation as closure. This greatly simplifies labeling and lowers costs by permitting the same stock bags to be used for many different products.

Much time is saved both in closing and opening of bags. Sewing closure at varying distances from top permits control of volume of bag, higher filling efficiency, greater package range with fewer bag sizes. Rip-Cord Closures also provide greater ease in handling, and increase storage capacity up to 20 per cent over wire tied bags.

● Wire Rope

Tournarope—a 6 x 19 filler wire right-lay, lang-lay wire rope with an independent wire-rope center and an identifying galvanized core strand, manufactured by R. G. Le Tourneau, Inc., especially for cable-operated tractor-drawn equipment, is now available through Le Tourneau-"Caterpillar" distributors. It is made of 199 fine steel wires, drawn to Le Tourneau's own specifications, each wire bathed in oil as it goes into the strand die.

All Le Tourneau equipment shipped from the factory is now equipped with this new, specially-made wire rope.

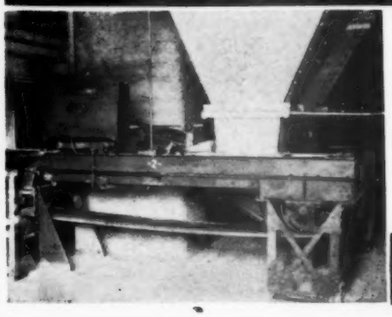
Tournarope comes in the following sizes ⅛, ½, ⅜, ¾ and ⅞ inch.

● Pump Bearing

A unique bearing unit has been developed to simplify adjustment and alignment of the bearings in the larger size dredging pumps made by the American Manganese Steel Division of The American Brake Shoe & Foundry Company, Chicago Heights, Illinois. The unit is covered by Patent No. 2,232,967 issued to D. A. Price, G. C. Janser and Perry I. Nagle and assigned to The American Brake Shoe & Foundry Company.

The aligning feature is provided by spherical surfaces on the outer cartridge faces and adjustment is provided by means of a threaded

This is the Dual Purpose WEIGHING MACHINE • MERRICK FEEDOWEIGHT



Feedoweight combines in a single unit a conveyor type feeder and scale.
It automatically feeds the material by weight and accurately totals and registers the amounts.
Precision is assured by power-operated feed and control gate.
Feeds two or more materials in correct proportions by batch or continuous method.
Write for Information

Merrick Scale Mfg. Co.
Passaic, New Jersey

sleeve and socket arrangement. The sleeve is readily accessible through an opening with a hinged cover and is turned to tighten or loosen it with a spanner wrench or screw driver.

The unit is lubricated separately from the sleeves and is not subject, therefore, to contamination from the oil which may come through the sleeve bearings.

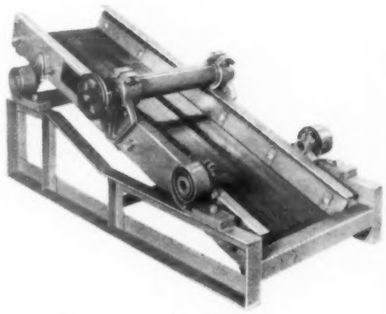
• Screen

The improved Overstrom vibrating screen is the result of over 20 years' experience in the design of vibrating-screen equipment by Overstrom & Sons, Los Angeles. They are manufactured in single, double, and triple-deck types, ranging in sizes from 2 by 4 feet up to 5 by 15 feet, suitable for light, medium and heavy-duty screening, either wet or dry.

The screen consists of a screen box supported on large spiral springs, a vibrator unit mounted on the screen box and a foundation supporting the frame. Vibration is by means of an unbalanced shaft mounted on two S.K.F. self-aligning spherical roller-bearings running in a bath of oil. The shaft and bearings are entirely surrounded by protective tubing, which in turn is clamped fast in steel castings welded to the sides of the screen box. The mechanism is so simple, sturdy and fool-proof in design that it requires the minimum of attention.

The use of oil, the maker claims, has many advantages over grease. Less power is required to operate the screen, and it starts easier in cold weather.

The vibrator element is a complete unit, and is reversible end for end in its clamp members if the operator desires to drive on either side. There are no counteracting or destructive



The improved vibrating screen.

forces, because the construction of the screen box is such that an imaginary line connecting the spring centers passes through the center of gravity of the screen box, and the vibrator unit is in alignment with this center of gravity.

All cloth supporting members are disposed longitudinally, and are dovetailed to receive a special oil-resistant rubber cushion. The screen cloths are readily accessible, and are placed under tension crosswise by means of side tension members which also serve as wearing plates and prevent material from leaking along the edges.

It's TRI-VIBE . . . . .

an exclusive engineering feature that makes the LEAHY Type C No-Blind Vibrating Screen the outstanding production unit in its field.

Users quickly discover that the triple-powered vibration of the free swinging screen jacket results in greater output of more uniform materials with reduced costs.

If you want further evidence, write for Bulletin No. 14-H.

The Deister Concentrator Company
The Original Deister Co.
Est. 1906
911 Glasgow Ave., Fort Wayne, Ind.

A Review of Recent Books

A.C.I. Manual of Concrete Inspection, *published by American Concrete Institute, Detroit. 140 pages. Price $1.00.*

In this new manual American Concrete Institute Committee 611, undertakes to describe those methods of inspecting concrete construction which are generally accepted as good practice. The manual is intended as a supplement to the specifications and as a guide in matters not covered by the specifications. It tells not only *what* the inspector should do but *why*. And it is not for the inspector alone; it should be invaluable to the man behind the inspector; and, because "the quality of concrete as a field-made product depends largely on workmanship," to every man responsible for workmanship.

The Committee's work was done to be useful not only to inspectors but also to engineers, architects, contractors, and others interested in construction. In particular, the first two chapters, ("The Inspector" and "Fundamentals of Concrete") are directed to those who arrange for and direct the work of inspection.

The manual is based on information from many sources—organizations and individuals. It now goes to Institute members and doubtless to many others, for study and use as the Report of Committee 611. Eventually the report is destined for consideration as a standard of the American Concrete Institute.

Economics of Business, *by Willard L. Graham. Published by the American Technical Society, Chicago. 330 pages. Price $2.00.*

Fortunately or unfortunately, there is more or less disagreement among economists on many points of economic theory. On fundamental issues, however, there is substantial agreement. In this book the attempt is made to avoid controversial issues, to outline the basic principles of the science of economics, to present the most generally accepted opinions on important points of theory, and to leave for advanced study, the conflicting assumptions, arguments, and points of view of individual economists.

It is the firm belief of the author that an understanding of economics is impossible without some basic knowledge of the history of the development of our social order. The first part of the book is devoted to this subject, directing attention chiefly to the economic development in England and in the United States. Later on he undertakes an analytical description of the component parts of our business and economic organization—in terms of "functions" or types of activity, such as production, marketing, banking transportation, etc. In conclusion, the author presents in logical order the fundamental principles of economics and their practical application to the solution of current business problems.

Thus this volume serves as an introduction to the intensive study of the various fields of business activity—selling, finance, manufacturing, accounting and others. It is basic subject matter which must precede any complete understanding of business operation within the complex social and economic organization in which we live.

Housing for Defense, *by Miles L. Colean. Published by the Twentieth Century Fund, 330 West 42nd Street, New York. 208 pages. Price $1.50.*

This report analyzes the basic elements of a national housing policy to meet the needs created by America's armament program. The factual findings and analysis were prepared by a special research staff headed by Mr. Colean. The report is a special project undertaken by the Fund's Committee on Housing. Last spring the Committee began work on a long-range survey of the whole question of housing. With the sudden sharpening of the international crisis in May and this country's decision to embark upon a large-scale defense

Miles of GOODALL BELTING for Defense!

The scene pictured above is typical of the enormous quantities of GOODALL CONVEYOR BELTING now being produced for defense and other industries.

Recognized for many years for its dependable quality, it is natural that belting bearing the GOODALL name should be called into service on every industrial front during the present production emergency.

Complete information on belting for your specific requirements will be promptly furnished. Address:

GOODALL
RUBBER COMPANY, Inc.
3 SOUTH 36th ST., PHILADELPHIA, PA.
Branches and Distributors from Coast to Coast

The Model "135" LOADER

is the fastest loading machine within $5,000 of its price, as well as heaviest, strongest and most powerful Loader built. It competes with BIG equipment. On a cost-per-yard basis, it's all alone. *Bulletin 134*

WRITE, WIRE OR TELEPHONE

HAISS

George Haiss Mfg. Co., Inc., 142nd & Rider Ave., New York

Who, for nearly half a century, have created and sold none but equipment of demonstrable superiority in design and manufacture.

Portable Conveyors—Revolving Screens

FIRST LINE OF DEFENSE AGAINST WASTE

USE

MANGANAL

Crushers, shovel and dipper teeth, tractor treads, pump parts, and a score of other pieces of equipment can be saved—made better than new and at insignificant cost—by the MANGANAL Method. Distributors everywhere carry MANGANAL 11 to 13½% Manganese Nickel Steel welding electrodes, applicator and wedge bars, plates and SEACO hard-surfacing electrodes. Write for the name of the distributor nearest you and a copy of the latest price list.

STULZ-SICKLES CO.

Newark New Jersey

program, the Committee thought it wise to turn aside temporarily from its long-range survey and analyze the immediate housing needs created by the emergency.

Probably the most basic finding of the survey is that private industry has the capacity to provide the major part of the housing needs of our defense program, but an immediate plan of action for defense housing is necessary if we are to avoid the delays and mistakes that seriously crippled America's war effort in 1917-1918.

ECONOMIC FACTORS AFFECTING INDUSTRIAL RELATIONS POLICY IN NATIONAL DEFENSE, *by Sumner H. Slichter. Published by Industrial Relations Counselors, Inc., New York City. 112 pages. Price $1.50.*

This book, the result of further exploration by Dr. Slichter along the lines of his previous study, "Economic Factors Affecting Industrial Relations Policy in the War Period," (1939) is timely and important. This volume covers many vital aspects of the present defense program; size and costs; labor requirements; effects upon exports; indirect demand for labor; guns versus butter; effect of changes in the cost of living; present labor shortages; need for training personnel; hours policy, wage policy, labor organization prospects, strikes; how treat employers who violate the Wagner Act; how modify trade agreements to meet defense production needs; union-management cooperation; and problems that are sure to arise when we shift from a defense to a nondefense program.

The most vital spot in this coördinated analysis is the page and a half entitled "Union-Management Coöperation." The requisites for its success are: "(1) an assured status for the union; (2) complete and vigorous support of the plan by top management and top union leadership; (3) avoidance of interference with prerogatives of foremen and other managers; (4) avoidance of interference with rights given the men by their trade agreement." . . . .

NAZI EUROPE AND WORLD TRADE, *published by the Brookings Institution, Washington, D. C. 200 pages. Price $2.00.*

The position in world trade of a German-dominated continent of Europe will not be determined merely by political forces. The productive resources of the area must be weighed against its needs to reveal the important elements of strength and weakness in its future economic position. Conceiving this area as a single country, excluding Russia and the states in the Russian sphere, and regarding the trade between its component parts as internal trade, the author undertakes to determine what problems it would face with regard to external trade.

The analysis is made in terms of past performance, since it is impossible now to evaluate losses in productive capacity caused by the destruction and dislocation now in progress, or the increased output that may result from future improvements in production techniques. No attempt has been made to weigh the problems that would be involved in unifying and coördinating the economic life of the area under a centralized planned economy.

Trade Literature

Traxcavator . . . More than a Machine. 12 pages. Trackson Company, Milwaukee.

Low Cost Crushing and Pulverizing with Gruendler "2 in 1" Hammer Crushers, 4 pages. Gruendler Crusher & Pulverizer Company, St. Louis.

History, Purpose and Practice of Metallizing (Metal Spraying), 52 pages. Metallizing Company of America, Chicago.

Trip-L-Seal—an Admixture for Concrete, 8 pages. Trip-L-Seal, Inc., Washington, D. C.

Link-Belt Elevator Buckets, (Bulletin 1912), 4 pages. Link-Belt Company, Chicago.

Amsco Power Shovel Dippers and Dipper Parts, (Bulletin 641-D), 24 pages. American Manganese Steel Division, American Brake Shoe & Foundry Company, Chicago Heights, Illinois.

Goodall Waterproof Clothing for Industry, (Catalog 203), 12 pages. Goodall Rubber Company, Inc., Trenton, New Jersey.

Telsmith Machinery for Mine, Quarry and Gravel Pit, (Bulletin 266M), 36 pages. Smith Engineering Works, Milwaukee.

Gypsum Sheathing, 20 pages. Gypsum Association, Chicago.

Manganese Steel Tractor Wheel Rims, (Bulletin 115), 4 pages. Alloy Steel & Metals Company, Los Angeles.

Kilns, Coolers and Driers, (Bulletin 115), 20 pages. Traylor Engineering & Manufacturing Company, Allentown, Pennsylvania.

Tournapull . . . Models C and Super C, (Bulletin TP-104). R. G. LeTourneau, Inc., Peoria, Illinois.

Lewis-Shepard Engineering Catalog of Materials Handling Equipment, (Catalog 21), 56 pages. Lewis-Shepard Sales Corporation, Watertown, Massachusetts.

MacWhyte Wire Rope Catalog, 160 pages. MacWhyte Company, Kenosha, Wisconsin.

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CURRENT BUSINESS INDICATORS

By far the most portentous event of the past month was the price-control bill that was presented to Congress on July 30. For at least six months government economists have watched the upward surge of prices with genuine concern. Almost without exception it was agreed that some form of price regulation was inevitable if the country was to avoid the violent inflationary price movements that attended World War I. Despite the urgency of the situation the Administration avoided facing the problem until popular clamor insisted upon action. As a result of this delay, the inflationary trend is already under way, and by the time the control legislation clears Congress —six weeks from now at the earliest— it is possible that prices may be rather seriously out of hand.

Although the present bill has little likelihood of winning congressional approval in its present form, the essential features of the bill are worth noting. Reduced to its simplest terms, the Administration's bill authorizes the President to establish maximum prices for commodities largely on the basis of the price level prevailing on July 29, 1941. For agricultural products, however, the bill provides that no price ceilings may be established below 110 per cent. of parity or the price prevailing on July 29, 1941, whichever is higher. Finally, the bill authorizes the President to establish maximum rent ceilings for low-cost housing accommodations in defense areas where rents have increased 10 per cent. or more since August 31, 1940.

It is particularly noteworthy that there is no provision for control of wages in the Administration's bill. This omission is of special significance to many of the extractive industries where the price level is very largely determined by the level of wages. Presumably, however, the control of wages has been left in the hands of the various governmental labor agencies that have already been established.

Price trends, meanwhile, have continued to furnish persuasive evidence of the need for some form of control. Measured by the Bureau of Labor Statistics index, wholesale prices rose to around 90 per cent. of the 1926 average by late July. Further advances occurred in the early weeks of August, and by the time the price-control bill is finally enacted the index is almost certain to be approaching the 100 mark.

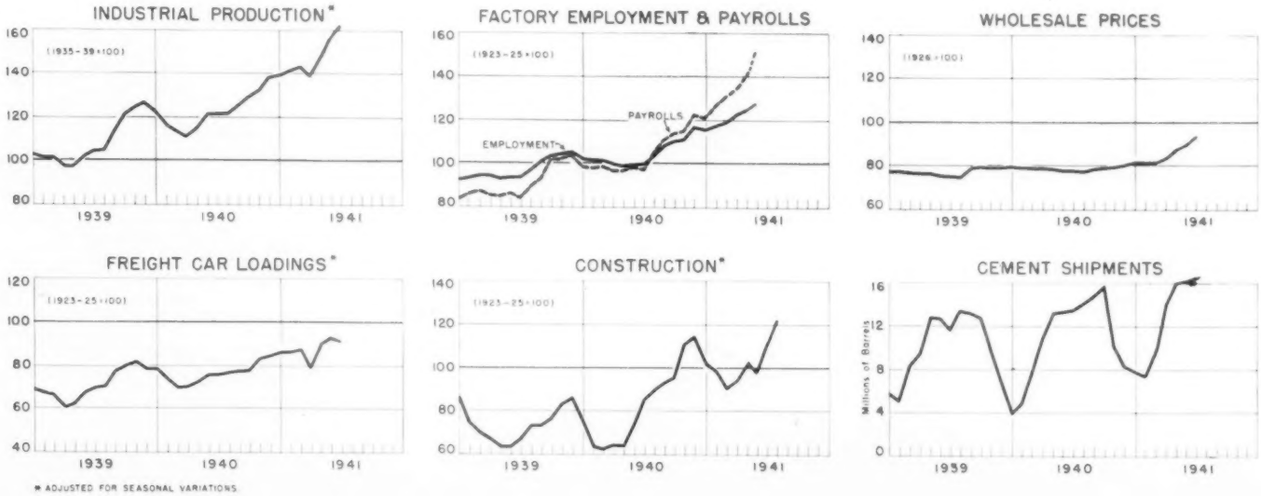
Industrial activity registered further important gains in July. On a seasonally-adjusted basis, the Federal Reserve Board's composite index of production in manufacturing and mining advanced to 162 per cent. of the 1935-39 average. This compares with 156 for the month preceding and 121 for July, 1940.

As in previous months of the current year, a steep increase in construction activity was an important factor contributing to the advance in the composite index. Moreover, it was nonresidential building (chiefly new industrial plants or expansions to existing industrial productive facilities) that was principally responsible for the rise in construction activity during the month. Since the beginning of the defense program, the government has committed itself to a plant-financing program that calls for the expenditure of $2,720,936,000. Approximately another billion dollars is being spent by private industry on expansions to industrial plants.

Residential building was also surprisingly well maintained considering the material and labor shortages that have developed. In fact, according to Dun & Bradstreet, the total volume of building permits awarded in July reached the highest level for the month in eleven years. This increase is in sharp contrast with the normal seasonal trend for the construction industry.

The steel industry likewise continued to operate at close to top speed in July. The total output for the month amounted to 6,821,682 tons, as against 6,800,730 tons in the previous month and 5,724,625 tons in July, 1940. Steel mills have now been operating above 90 per cent. of their capacity for almost a year and, with the exception of a brief period when strikes curtailed output, the industry has operated at 95 per cent. of its capacity or better since last November. A small decrease is expected in steel output during the next few weeks largely because of the shortages of scrap and pig iron that have recently developed.

Other important business barometers have likewise continued upward. Cement shipments, for example, rose to 16,687,000 barrels in July, as against 16,109,000 barrels in the previous month and 13,442,000 barrels in the corresponding month of last year. Production and sales of virtually all types of consumers' goods have remained at surprisingly high levels. Consumer demand, however, has centered largely on such durable items as new houses, automobiles, refrigerators, washing machines, etc. This demand has been inspired by the threat of curtailment and the anticipated increase in retail prices.



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"to put every ounce of effort into producing these munitions swiftly and without stint. And with this appeal I give you the pledge that all of us who are officers of your Government will devote ourselves to the same wholehearted extent to the great task which lies ahead.

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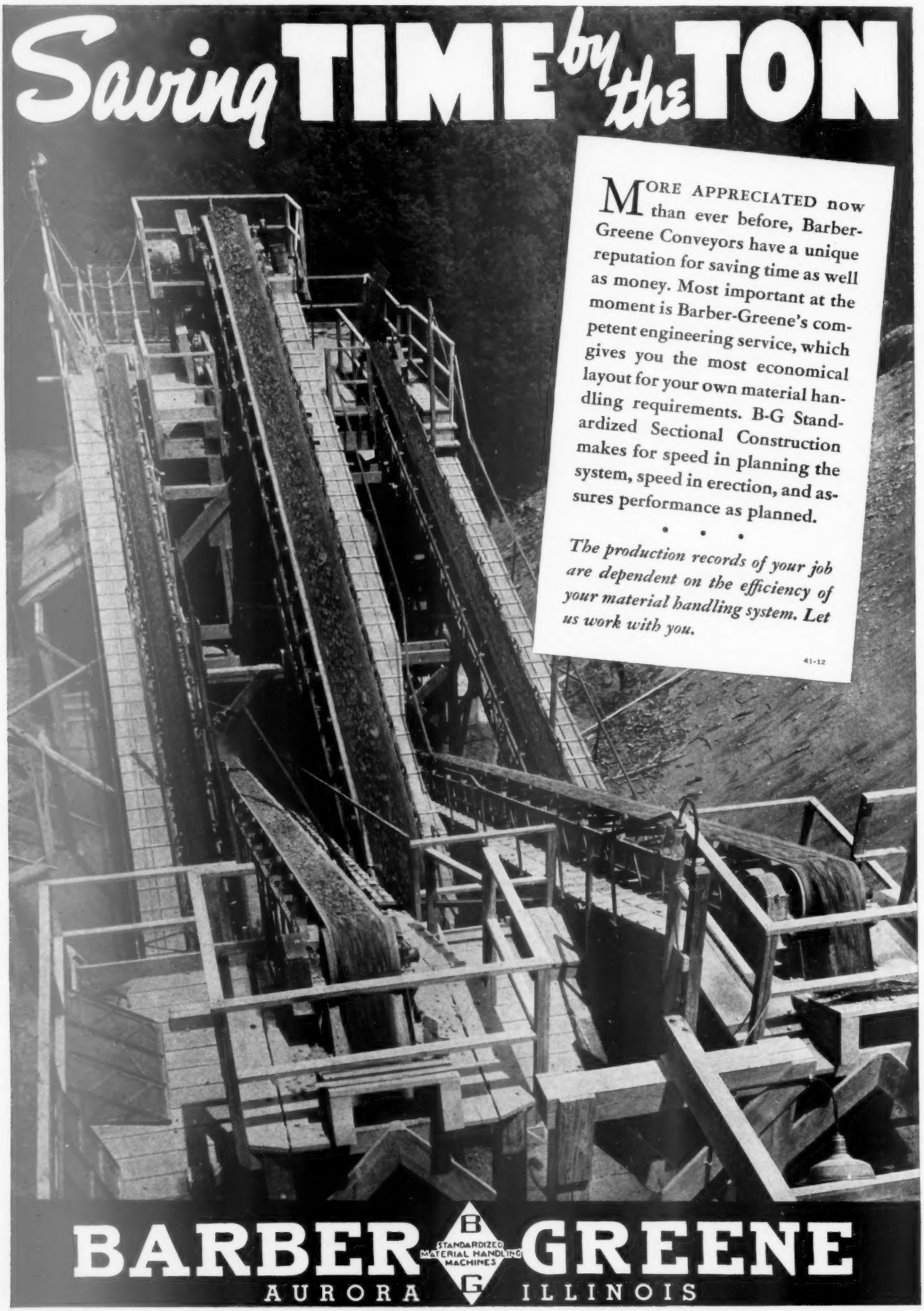

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The CONCRETE MANUFACTURER

September, 1941

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Field Editor:
W. E. TRAUFFER

Associate Editor:
HARRY F. UTLEY

Circulation Manager:
W. T. KLUSSMAN

Advertising Manager:
JAMES E. MONTGOMERY
Telephone HARrison 9357
Chicago, Ill.

Eastern Advertising Manager:
W. A. WILSON
Room 430, 122 East 42nd St.
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To Build 375 Residences

Concrete blocks will be used to construct 375 single-family residences at Burlington, Iowa.

A $1,184,219 contract for their erection has been awarded the Lovering Construction Company of St. Paul by the federal government. The exterior surfaces will be painted, interiors will be plastered.

The units will be supplied the contractor by concrete-products manufacturers in the Burlington area. The dwellings are being built to house workers at the new Burlington Ordnance Plant.

■

Mortarless Units Used Abroad

The Mortarless Hollow Tile Company of Manila, Philippine Islands has been awarded a contract for the construction of 1,000 mortarless-masonry houses in Manila. The units are being manufactured on four machines supplied by the Mortarless Tile Machine Company of Los Angeles. This method enables the erection of walls by unskilled labor.

A similar housing project in Venezuela is being supplied with units produced on eight machines which were recently shipped by the Mortarless Tile Machine Company of Los Angeles.

■

Ready-Mix on Iron Range

The first ready-mix-concrete plant on the Minnesota iron range went into operation recently at Hibbing, Minnesota.

Owned by the Mesaba Construction Company, deliveries are being made in two truck-mixers at present.

■

Opens Two Delaware Plants

Offering facilities not previously available in that area, new amiesite and ready-mixed concrete plants have been placed in operation in Newport, Delaware, by the Newport Paving & Supply Company, Inc.

The new plans, according to an announcement by H. P. Wilson, president of the company, have capacities of 60 tons of amiesite per hour, and 60 cubic yards of concrete per hour.

The company has a fleet of 11 new trucks, five of them truck mixers.

Altogether, the plants represent an investment of about $100,000. Delaware and nearby Pennsylvania are being served by the firm.

■

Pipe for Bomber Plant

Two Nebraska concrete products companies were given contracts recently in connection with the erection of the $14,000,000 Martin bomber plant near Omaha. A $30,000 contract was awarded to the Nebraska Culvert & Pipe Company of Wahoo. The order consists of concrete drainage pipe ranging from 6 to 60 inches in diameter, according to William Placek, plant manager.

The Platte Valley Cement Tile Manufacturing Company of Fremont, was awarded a $25,000 contract for concrete pipe.

■

Indiana Plant Keeping Busy

The Lake Shore Cement Products Company at Michigan City, Indiana, is operating on a 24-hour-a-day schedule turning out blocks for defense work. Contracts include the new Studebaker Corporation aviation-engine plant at South Bend and the Kingsbury Ordnance Plant at Kingsbury, Indiana.

Multiplex and Miles equipment is used to produce the units. The company moved into its new plant late last year. Norris Leigh is the owner.

■

Burke Brothers Open Plant

Burke Brothers, operating for many years at Anderson, Indiana, as the Burke Construction Company have formed the Transit Mix Concrete Company and have leased a part of the idle American Steel & Wire Company building at Cedar Street and the Big Four Railroad.

Some of the contracts already landed are for two paved highways, a large bridge near Elwood, Indiana, and several sidewalk and curbing jobs in new additions near defense districts. They will also supply concrete for paving streets around local defense plants. Gary and George Burke are members of the firm.

The CONCRETE MANUFACTURER

Concrete Floor Tiles Gain Ready Acceptance for Ohio Operator

Workmen making the floor tiles at the Stonex plant. Freshly-made units, still in pans, are racked up along the walls.

THE manufacture of Stonex concrete floor and wall tile got its start in southern Florida and several articles in past issues of THE CONCRETE MANUFACTURER have described the process and plants operating there. The manufacture of this product is now spreading to all parts of the country, including those having long and cold winters. The first company to produce Stonex tiles in the Middle West is Stonex Industries of Ohio, located at Baltic, a small town in eastern Ohio within easy shipping distance of many large cities.

The original company, known as the Stonex Company of Ohio, was formed by Walter Mast, an official of a large clay-products concern in Baltic and the plant went into operation in July, 1940. John C. Hotham became a partner in this firm late in 1940, and in March 1941 O. J. Yoder took over Mr. Mast's interest. Mr. Yoder is now in charge of sales and Mr. Hotham is general manager. Plemon "Speed" Hester came up from the Stonex plant in Miami to get this plant started and has remained to operate it. His experience began at the Fort Lauderdale plant, where the Stonex process was developed. The Ohio company's franchise covers a radius of about 75 miles from the plant.

As might be expected in a pioneering venture of this kind, sales at first came slowly but have grown steadily with one job selling others. The first order was for the floor and wall tiles for a kitchen and bathroom. The next was for the floor in an addition to a church. This was followed by an order for a complete new house and then things really started. Until recently most of the business came from small projects, one of the largest orders being 1,100 square feet for a combination restaurant and filling station in Attica, Ohio. Now, however, several orders of up to 10,000 square feet each are on hand.

Variety in color, texture and size of the tiles is apparent in this view of part of the stock.

The same formulas, methods and equipment for manufacturing these tiles are being used as in the Miami and Fort Lauderdale plants. The reader is referred to descriptions in the June and November 1940 issues for details. The greatest demand is for the 24- by 24-inch reinforced floor tiles which are 2 inches thick. Other popular products are the 12- by 12- by ¾-inch floor tiles and the 6- by 6-inch wall tiles. All types of specials are also being manufactured and experiments are being made with glazed-finish bricks for exterior and interior use. Vibrated tile stair treads have also been made. The concrete joists and the tiles are made by the Stonex process using Kirk & Blum forms, pans, and vibrating tables. A Clipper electric saw is used to cut both the tiles and the joists.

The tiles are made in 20 different colors, and combinations can be made to suit any taste, or to match furnishings. A sufficient stock is kept on hand to meet ordinary demands. Smith oxide colors are used and the silica-sand aggregate comes from northeastern Ohio.

(Continued on page 94)

Two workmen fashion a set of 12- by 12-inch tiles on one of the vibrating tables.

L. J. Lurie, president of Stonex Industries; John C. Hotham; Plemon Hester; and O. J. Yoder.

30-Wheel Truck-Trailer "Trains" Carry Aggregates to Detroit Concrete Plant

One of the 27-cubic yard trailer trains at the plant.

By HARRY F. UTLEY

PROBABLY because Detroit is the world center of the automotive industry, the motorized transportation of goods is more apparent there than in any other city. The extensive use of trucks and trailers is a "natural," too, because of the broad, safe highways and streets found in Detroit and Wayne County. Express and local traffic, passenger cars and motor trucks travel smoothly and in heavy volume over these roads with little delay due to the almost complete absence of grade intersections on the through routes. Highway experts recognize this development as the best to be found in the world.

The busy Joy Road ready-mixed-concrete plant of the Cooper Supply Company is kept supplied with aggregates by two large-capacity truck-trailers which operate between the plant and the pits of Foley & Beardslee at Waterford, Michigan, 33 miles distant.

The two "trains" are identical in design. A White truck is coupled to two Fruehauf steel truck trailer units, the one immediately following the truck being of the semi-trailer type. Each train has a total capacity of 27 cubic yards of material, 12 cubic yards being carried in the tandem semi-trailer in front and 15 cubic yards in the 8-wheel rear trailer. Each train rolls on thirty 9- by 20-inch Goodyear tires. The trailers are of the bottom-dump type and are equipped with 16- by 4½-inch Westinghouse air brakes. Formerly a fleet of standard trucks was used and, while cost figures are not available, the company reports that the trailer-trains have cut aggregate-delivery costs tremendously, as one can readily believe.

The materials are dumped into a concrete pit at the Cooper plant. This pit has three compartments for different sizes of material and grate-type runways over the pits, and the dump trailers are spotted over the proper compartments when the loads are discharged. Considerable quantities of aggregates are also kept in reserve piles from which a Northwest crane equipped with a Kiesler clam-shell bucket keeps the pits filled.

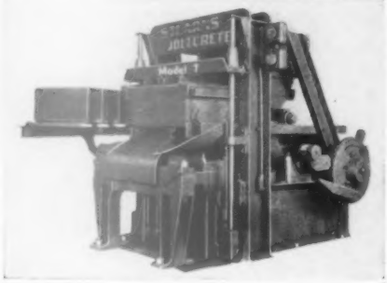
The batching and bulk-cement plants are excellent examples of semi-automatic operation and were built by the Erie Steel Construction Company. Inclosed bucket-elevators, supplied by the Columbus Conveyor Company, carry the aggregates and cement (trucked in from Cement City, Michigan) up to the plant bins. The cement bin has a capacity of 300 barrels and the 4-compartment aggregate bins hold 100 tons.

The batching is done by push-button and lever control from the dispatching room on ground level. This room is neat and orderly, the batching controls being conveniently arranged with respect to the Niagara water meter, the Kron dial scale for aggregates, and the 2-beam Buffalo scale for cement. The cement is weighed automatically.

Eighteen Jaeger truck-mixers on White chassis make up the mixing-and-delivery fleet. Twelve of the units are of 4-cubic yard capacity, five carry 3

Trailers in dumping position over the pits.

The Vibration Machine Supreme

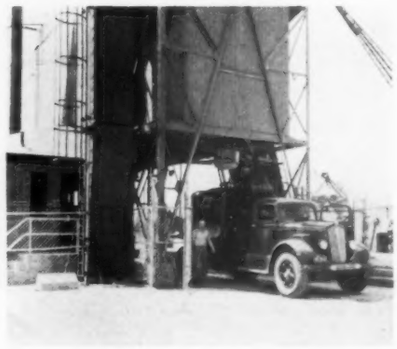


Vibration under pressure — 7,200 blows per minute—and ruggedly built to give long life, the Joltcrete machine is the choice of the wise concrete-products operator. Produces clean-cut, high strength units in any size, and gets the most out of a bag of cement. Built in three sizes with capacities of 7 to 9 standard units per minute.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers, and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager Columbus, Ohio

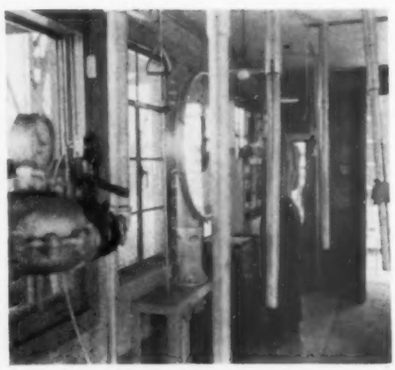
The plant, with bulk-cement bin and elevator in foreground.



One of the truck-mixers being charged with cement.

cubic yards, and one carries 2 cubic yards. The truck-mixers and aggregate trains are painted brown with lettering in yellow.

The Cooper Supply Company has been in the building-supply business for many years and entered the ready-mixed-concrete business a decade ago, when it opened a plant at its Eight-Mile Road yard. This plant is still in operation. To-day the company is one of the leading suppliers of concrete in the Detroit metropolitan area and, besides keeping its own sizeable truck-mixer fleet busy, often batches concrete materials into mixer units operated by its competitors. Gage W. Cooper is president and general manager. Cal Benges is general superintendent and supervises the Eight-Mile Road plant, while Ray Welch has charge of the Joy Road operations described here.



Batching levers and scales in the office.

Stonex *(from page 92)*

All the deliveries are made by hired trucks and the plant crew is used to install the tiles and joists at the closer jobs. On more distant installations Mr. Hester supervises the local stone-masons who do the work. Some trouble was at first experienced with shrinking of the mortar between the tiles, but this was overcome by letting the mortar set for an hour after mixing and then remixing and tempering it.

It has been found that houses with Stonex tile floors cost less to heat and retain the heat longer than those of wooden construction.

The plant is in a 70- by 80-foot modern brick building with a steel-truss roof, but the need for more space is already being felt. Already joist-manufacturing operations have had to be moved into another building. Manufacturing was carried on through the winter and no trouble was experienced in maintaining an inside temperature of 76 degrees. All the products are cured for 28 days before they are shipped.

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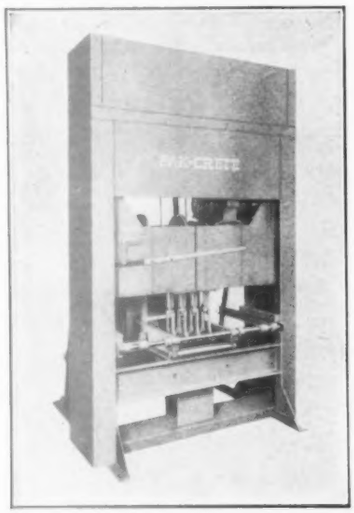

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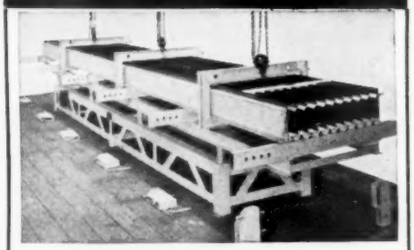

STEEL FORMS for Concrete Joists

These forms are made in standard 20-ft. lengths. Also special lengths to meet individual requirements. The illustration above shows method of removing complete set of poured joists, which permits multiple production where desirable or feasible.

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Cinder-block makers and convention guests photographed on Atlantic City's famous board-walk.

Promotion of Product Chief Topic as Cinder-Block Manufacturers Convene

PROSPERITY was the keynote of the eighteenth annual convention of the National Cinder Concrete Products Association at the Hotel Traymore, Atlantic City, August 4, 5 and 6 and, paradoxically, it had the effect of decreasing the attendance as compared with last year. Many of the members were simply too busy to get away from their plants where, with many, two and three shifts is the order of the day. But for those who could arrange their affairs to attend, the convention proved valuable from the standpoint of information and entertainment, from the standpoint of contacts and environment.

President George W. Goelitzer, Kansas City, called the first meeting to order and surprised everyone by not reading a long speech. Committee reports followed with a discussion of finances and after luncheon the convention began in earnest with a marketing clinic conducted by Clifford C. James, of the University of Baltimore.

In the absence of Louis Brookman, Jr., Paul M. Woodworth of the Portland Cement Association read Mr. Brookman's ideas of *New Marketing Developments in the Building Industry*. Mr. Brookman's principal point was that the present is no time to "let down" on promotional practices, but rather to increase them. He advocated use of the radio to sell the idea of cinder blocks to the prospective builder.

Speaking on the same subject for himself, Mr. Woodworth indorsed Mr. Brookman's suggestions, particularly as the peak in defense housing should be reached late in 1942 and the concrete-products manufacturer will have to find new markets by that time if he expects to keep on at the same rate of production. Mr. Woodworth called attention to the scarcity of steel and urged the products men to anticipate their machinery needs and order parts well in advance.

Frank B. McKenna, advertising manager of the Lehigh Portland Cement Company, gave the convention the benefit of an expert's opinion on promotion and earnestly urged all possible publicity now in anticipation of a future which may be not so bright.

Cinder Block and the Architect was the theme of the next three speakers, who were: Thomas J. Early, a Philadelphia architect; Charles W. Akers, Breeko Corporation, Nashville; and Herbert J. Vincent, Cinder Block, Inc., Detroit. Mr. Early thought a better system of finishing could be devised and said lower prices were desirable on special shapes. Mr. Akers stressed the need for a higher plane of salesmanship. Running down a competitor's products simply reacts on the representative, and if all indulge in the same practice the architect loses faith in the product from whatever source it comes, he said. Mr. Vincent devoted his remarks to the promotion of cinder blocks by various methods that have increased his own company's output to 3,000,000 blocks annually.

On *The Future of Small Homes and Developments,* Howard S. Davidson of *Better Homes and Gardens* magazine advocated the model home as the best method of promotion and urged co-operation with local newspapers. An exclusive right to promote the model home would bring the best results, he thought, and for that purpose he advised that the best local newspaper should be chosen. David Scribner, executive vice-president of the Eastern Housing Corporation, and Leo A. Kirk, director for the Federal Housing Administration in Eastern Pennsylvania and Delaware, gave interesting sidelights on the housing situation.

The second day of the convention saw everything from business sessions to a banquet. Charles A. Flanagan, chief of the Bureau of Building Inspection, Philadelphia, praised the work of the association and urged the continued maintenance of high standards. Harry H. Longenecker, popular and perennial secretary of the association, recalled in this connection a check on the standards of the membership that came just a shade under a complete 100 per cent., which he thought gratifying.

M. Max Dunning took the place on the program for John M. Carmody, administrator of the Federal Works Agency at Washington, and said that local conditions governed the selection of cinder concrete in defense housing.

Leo A. Kirk of the Federal Housing Administration next ran off a motion picture which the government is about

to send out to theaters that should do a great deal to increase the interest in, and demand for, home building. The picture is titled "We Americans" with Frank Cravens, veteran actor, in the leading roll. Millions will see this film and realize how easy it is to own their own homes.

Thomas S. Holden, president of the F. W. Dodge Corporation, contributed one of the most important talks of the convention when he spoke on the subject: *What is the Future of American Business and its Relation to the Building Industry?* This future, Mr. Holden thinks, is bright, and not likely at all to be the dismal portrayal many are expecting, particularly if inflation can be avoided.

Mr. Holden said he had no fear of state socialism after the emergency, as he thought a reaction would prevail against government control. However, if Germany is defeated, the United States will be compelled to avail itself of a natural world leadership which it shied away from after World War I, and to that end national unity is greatly needed.

The next six months, Mr. Holden thought, would be like the last six months, with a tapering off in activity from January to July. The current year of July to July should be much better than the preceding 12 months, as a whole. A backlog of construction will probably take up the slack as emergency construction begins to end. Rehabilitation of slum areas in Illinois, Michigan and New York, points this trend.

A symposium on promotional methods by the block manufacturers brought out the fact that the industry is keenly appreciative of advertising.

Dean R. Lynde, Cinder Concrete Products, Inc., Denver, had a transcription of this company's radio program run off, which proved very interesting. Mr. Lynde said that actual results have justified the use of the radio in Denver.

"Gene" Olson.

Claude Harrison, Jr., advertising agent for Cinder Block, Inc., Roanoke, Virginia, told how smart advertisers everywhere are taking advantage of the present opportunity to build goodwill, though few if any are seeking immediate business.

A. C. McGuire, Comack Builders' Supply Corporation, Rochester, New York, said advertising in addition to present activities represented lots of work, but his firm was doing more advertising than ever before and was thoroughly sold on the idea.

Fred Reinhold.

Fred W. Reinhold, Anchor Concrete Products, Inc., Buffalo, spoke of success with advertising novelties.

Charles W. Akers, Breeko Corporation, said that a few good cinder-block houses and owners represented the foundation of all advertising. He also advocated newspaper advertising, radio and billboards. Mr. Akers also urged the association to effect a tie-up with national advertisers of building materials so that cinder-block houses may be seen in national media more frequently.

The second day's activities were climaxed with the banquet in the evening, which lasted from 8 until 12 o'clock. An excellent dinner was served, there was dancing at intervals, then a program of professional entertainment.

The final day's program brought three of the leading manufacturers of equipment before the products manufacturers: A. B. Babbitt, president of the Kent Machine Company, Cuyahoga Falls, Ohio; Eugene F. (Gene) Olsen, president of the Stearns Manufacturing Company, Adrian, Michigan; and Haakon Paulson, general sales manager of the Besser Manufacturing Company, Alpena, Michigan; appearing in the order named.

Mr. Babbitt called attention to the higher plane of ethics that exists in the selling of concrete machinery to-day and exemplified the point by relating the merits of his own line without any criticism of the others. Needless to say Messrs. Olsen and Paulson were just as scrupulous.

Mr. Olsen stressed the desirability of buying machinery suited to the customer's particular needs and made a considerable point of the value of modern design. He spoke of employing an engineer who had devoted much of his time to eliminating vibration, for the study of making vibration useful, and results have been gratifying.

Mr. Paulson gave a moving-picture talk, demonstrating the practical use of his firm's equipment. Many of these pictures he had taken himself. The color pictures he showed were particularly good. Various plants throughout the country were featured.

Election of new officers and directors marked the closing session. The roster for the ensuing year will be as follows: Chairman of the board, George W. Goelitzer; president, Cloyd B. Fellabaum; vice-presidents, Herbert A. Davis and A. C. McGuire; secretary-treasurer, Harry H. Longenecker; directors, Samuel Paturzo, Herbert J. Vincent, Edmund Smith and Dean Lynde. Particular credit was given George J. Barker, general chairman of the convention committee, for the success of the meeting.

The registration list as compiled by the secretary was as follows:

Akers, Charles W., Breeko Corporation, Nashville.
Barkelew, Peter V. O., Whitehall Cement Manufacturing Company, Philadelphia.
Babbitt, A. B., Kent Machine Company, Cuyahoga Falls, Ohio.
Brown, Stephen R., Kent Machine Company, Chatham, New Jersey.
Bowling, A. L., Cinder Block, Inc., Roanoke, Virginia.
Barker, George J., Gerlach & Moranz, Philadelphia.
Busecca, Geno., Gerlach & Moranz, North Plainfield, New Jersey
Bulno, Ben, Federal Housing Administration, Philadelphia.
Bausman, Thomas F., Harrisburg Building Units Company, Harrisburg, Pennsylvania.
Brooke, Edmund H., Nailable Cinder Block Company, Brooklyn.
Crawford, Wm. O., Edison Cement Company, Philadelphia.
Clink, George E., Glen Falls Portland Cement Company, Glen Falls, New York.
Condon, Henry J., Glen Falls Portland Cement Company, Raritan, New Jersey.
Corson, Samuel H., Hatboro Concrete Block Company, Hatboro, Pennsylvania.
Chenery, John C., Atlantic Brick & Tile Company, Watertown, Massachusetts.
Corrado, Anthony, Builders Concrete Units & Tile Corporation, Providence, Rhode Island.
Celona, Joseph, Jr., Rhode Island Cinder Block Company, North Providence.
Colmar, Stephen, Rambloc Stone Company, Albany, New York.
Canon, James C., Standard Dry Wall Products, New Eagle, Pennsylvania.
Campbell, R. D., General Cement Products Co., Pittsburgh.
Connar, V. N., Universal Atlas Cement Company, New York City.
Coffman, Herbert, Hercules Cement Corporation, Philadelphia.
Condo, Ralph C., James Condo & Son, Somerville, New Jersey.
Cushman, B. A., Bedford Hills Concrete Products Corporation, Bedford Hills, New York.
Cronin, Cornelius F., Cronin & Archer, Bel Air, Maryland.
Dunning, N. Max, Public Buildings Administration, Washington, D. C.
Davis, Herbert A., Washington Concrete Products Company, Washington, D. C.
Davidson, H. S., *Better Homes & Gardens*, Chicago.
Egbert, D. R., PIT AND QUARRY, Chicago.
D'Emilio, Guido, Milano Art Tile Company, Stafford, Pennsylvania.
Ellis, Wm. H., Ellis Concrete Products Company, Bridgeport, Pennsylvania.
Earley, Thomas J., Ellis Concrete Products Company, Philadelphia.
Freedman, Jack, Massachusetts Cement Block Company, Medford, Massachusetts.

Freedman, Louis, Massachusetts Cement Block Company, Medford, Massachusetts.
Faber, Gerhardt, Faber Cement Block Company, Ridgewood, New Jersey.
Fogel, Paul M., Cinder Concrete Products, Inc., Kansas City.
Flanagan, Charles, Philadelphia Building Inspection Bureau.
Hartman, H., Lawrence Portland Cement Company, Philadelphia.
Murray, I., Lawrence Portland Cement Company, Philadelphia.
Gilbertson, H. S., Lehigh Coal Company, Lansford, Pennsylvania.
Goelitzer, George W., Cinder Concrete Products, Inc., Kansas City.
Giddings, Walter S., Kent Machine Company, Atco, New Jersey.
Guadagno, Joseph A., New Jersey Materials Company, Inc., Matawan, New Jersey.
Gerlach, Clifford, Gerlach & Moranz, Philadelphia.
Gumpert, Richard T., Nazareth Cement Company, Harrisburg.
Giaimo, Charles F., Multiplex Concrete Company, East Orange, New Jersey.
Griffith, Edward, Lone Star Cement Corporation, New York City.
Ginder, Willard R., Charles S. Rockey & Company, Philadelphia.
Holden, Thomas S., F. W. Dodge Corporation, New York City.
Hepburn, William, Lehigh Portland Cement Company, Allentown, Pennsylvania.
Hand, Clifford C., University of Baltimore, Baltimore.
Korth, D. W., Universal Atlas Cement Company, Philadelphia.
Kirk, Leo, Federal Housing Administration, Philadelphia.
Kline, Harry, Rednor & Kline, Inc., Morrisville, Pennsylvania.
Knaple, C. Milton, Hercules Cement Company, Philadelphia.
Longnecker, H. H., National Building Units Corporation, Philadelphia.
Lynde, Deane R., Cinder Concrete Products, Inc., Denver.
Inglis, Stuart, Wagaraw Builders Supply Company, Fairlawn, New Jersey.
Kirshbaum, Herman, Penn Crete Products Company, Philadelphia.
McGuire, Alden C., Comac Builders Supply Corporation, Rochester.
McKenna, Frank B., Lehigh Portland Cement Company, Allentown.
McCune, Stephen, S. A. McCune Block Company, Morristown, New Jersey.
Morgan, E. C., Nazareth Cement Company, Nazareth, Pennsylvania.
Moore, A. F., Penn-Dixie Cement Corporation, New York City.
Miller, Henry, Jr., Forest Hills Concrete Block Company, Forest Hills, L. I.
Miller, H., Forest Hills Concrete Block Company, Forest Hills, L. I.
Olsen, Eugene F., Stearns Manufacturing Company, Adrian, Michigan.
Nagle, J. R., Alpha Portland Cement Company, Haddonfield, New Jersey.
Lawler, Charles P., Jr., Bethayres Concrete Products Company, Bethayres, Pennsylvania.
Paulson, Haakon, Besser Manufacturing Company, Alpena, Michigan.
Peters, S. N., Jr., Lawrence Portland Cement Company, Philadelphia.
Paturzo, Samuel V., Paturzo Brothers & Son, Baltimore.
Paolella, Philip, Hamden Building Tile Company, Inc., Hamden.
Peters, A. H., Giant Portland Cement Company, Philadelphia.
Price, Max, Massachusetts Cement Block Company, Medford, Massachusetts.
Moranz, Edward R., Gerlach & Moranz, Philadelphia.
Quary, Richard R., Federal Housing Administration, Washington, D. C.
Rogers, Ansel T., North American Cement Corporation, New York City.
Rednor, H., Rednor & Kline, Inc., Morrisville, Pennsylvania.
Reinhold, Fred W., Anchor Concrete Products., Inc., Buffalo.
Smith, Edmund A., Cinder Block Company, Richmond, Virginia.
Straub, F. J., New Kensington, Pennsylvania.
Stanwyck, John J., Medusa Products Company, Cleveland.
Scribner, David, Eastern Housing Corporation, New York City.
Paterson, Arthur W., Concrete Units, Inc., New York City.
Prettzman, Edward M., Grays Ferry Brick Company, Philadelphia.
Teichman, M. E., Multiplex Concrete Company, East Orange, New Jersey.
Vincent, Herbert J., Cinder Block, Inc., Detroit.
Woodworth, Paul M., Portland Cement Association, Chicago.
Wyman, C. E., Medusa Portland Cement Company, Cleveland.
Watt, A. G., Lehigh Portland Cement Company, Allentown.
Williams, Harvey A., Cherrydale Cement Block Company, Arlington, Virginia.
Wanicek, John J., Nelson Concrete Stone Company, Baltimore.
Warren, M. R., Soc. Cast Stone Company, Knoxville, Tennessee.
Waller, V. W. S., Whitehall Cement Manufacturing Company, Philadelphia.

STONEX

Concrete Floors

The De Luxe Tile of Distinctive Style

ALL COLORS
ALL SHAPES
ALL SIZES
HARD as granite
EASY to place
LOW in COST

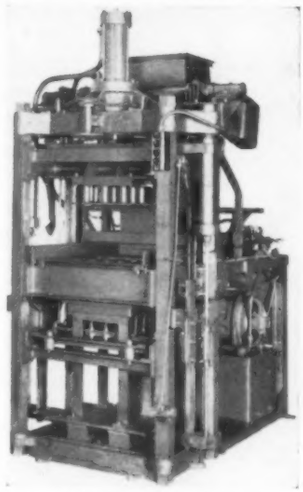
Here is today's biggest opportunity for Concrete Products Manufacturers!

Start with STONEX as a sideline, and it will soon be the main stem of your business.

Write for details

STONEX INDUSTRIES
500 N. W. 79th, Miami, Florida
33 N. La Salle St. . . . . Chicago

Why not BUY the LATEST FASTEST and BEST PRODUCTION BLOCK MACHINE



HYDRAULIC VIBRA PRESS

Write for information.

KENT MACHINE CO.
Cuyahoga Falls, Ohio

ONE Machine for ALL Size Pipe

Cut your costs of concrete pipe production by using the same machine for all sizes from 6" to 60".

Universal "all purpose" concrete pipe machine produces quality pipe at lowest cost, because it requires smaller investment, insures greater footage per bag of cement, and more pipe per man.

Start the concrete pipe business with Universal equipment, and you will be sure of maximum profits.

Write for Bulletin

UNIVERSAL CONCRETE PIPE CO.
Columbus Ohio

LOW INITIAL COST
LOW MAINTENANCE COST

Save money on your production costs by installing Chase Lift Truck Rack or Concrete Cars with Chase Patented Spring bearings —dust proof, oil retaining flexible boxings with roller bearings. Used and recommended in most of the concrete plants.

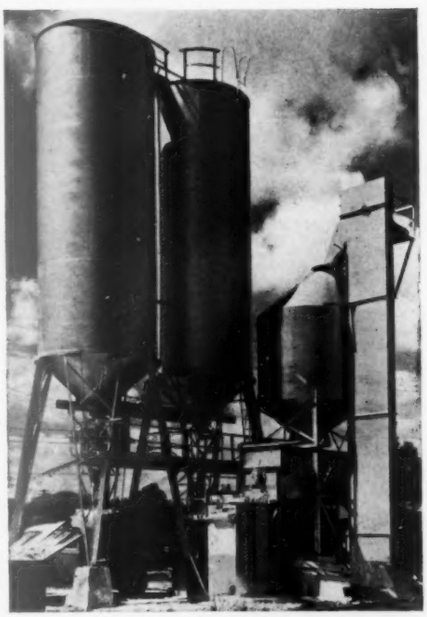
WRITE
For Catalog and
Special Low Prices

Complete line of concrete block cars, decks, Lift Truck Racks, transfer cars, turntables, dump cars, etc.

CHASE DRYER CARS & TRANSFER CARS
CHASE FOUNDRY & MFG. CO. COLUMBUS, OHIO

THE BROOKS-TAYLOR
Lime Putty Plant

. . . provides a means of producing and handling aged lime putty in accordance with the Brooks-Taylor process, two important features of which are the slaking of lime under thermal control and the use of patented filters to remove excess water from the putty during the ageing process. Ready mixed brick mortar made with aged lime putty is convenient, economical and of superior quality. Write for information.



CHICAGO BRIDGE & IRON COMPANY

Chicago.....2451 McCormick Bldg.
New York.....3389—165 Broadway
Cleveland..Builders Exchange Bldg.
Boston.1550 Consolidated Gas Bldg.
Houston.....5638 Clinton Drive
Tulsa.....1648 Hunt Bldg.
Birmingham.1503 North Fiftieth St.
Detroit.....1552 Lafayette Bldg.
San Francisco.....1092 Rialto Bldg.
Los Angeles....1457 Wm. Fox Bldg.

QUINN PIPE FORMS

HAND or WET PROCESS

Make concrete pipe on the job with Quinn Pipe Forms. They can be handled by less experienced labor and produce uniform concrete pipe of highest quality. Quinn Pipe Forms make pipe conforming to A. S. T. M. requirements as to wall thickness and other standards.

Quinn Heavy Duty Pipe Forms are built to give more years of service — sizes for any diameter pipe from 12 to 84 inches — tongue and groove or bell end pipe — any length. Backed by over 30 years of service in the hands of contractors, municipal departments and pipe manufacturers.

HEAVY DUTY PIPE FORMS

Our Heavy Duty type with Adjustable Locks is shown above. Quinn Heavy Duty Forms are also available with a new wedge-type lock.

MEDIUM DUTY PIPE FORMS

Meet the demand for low cost equipment that produces a uniform quality of pipe in smaller amounts. For making pipe 12 to 60 inches in diameter —any length.

WRITE TODAY

Get complete information on prices and Special Construction Features of Quinn Pipe Forms. Give us size of job for estimate on your pipe form needs. Also manufacturers of Quinn Concrete Pipe Machines for making pipe by machine process.

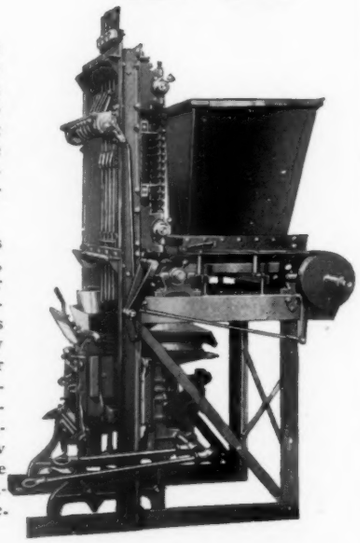
QUINN WIRE & IRON WORKS 1627 12th ST. BOONE, IA.

Miles CONCRETE EQUIPMENT

simple as A B C

It isn't how MUCH you invest that counts, but WHAT YOU EARN on your investment. MILES Concrete Products Plant Equipment will insure increased output, at lower first cost and lower operating cost.

MILES equipment is simple in construction, yet ruggedly built for the severest kind of service. Expert mechanics are unnecessary . . . any workman can keep your MILES equipment operating in first-class condition at all times. Investigate! Get the facts now . . write for a complete catalog of MILES machinery for the concrete-products plant.



MILES MANUFACTURING CO.
JACKSON, MICHIGAN

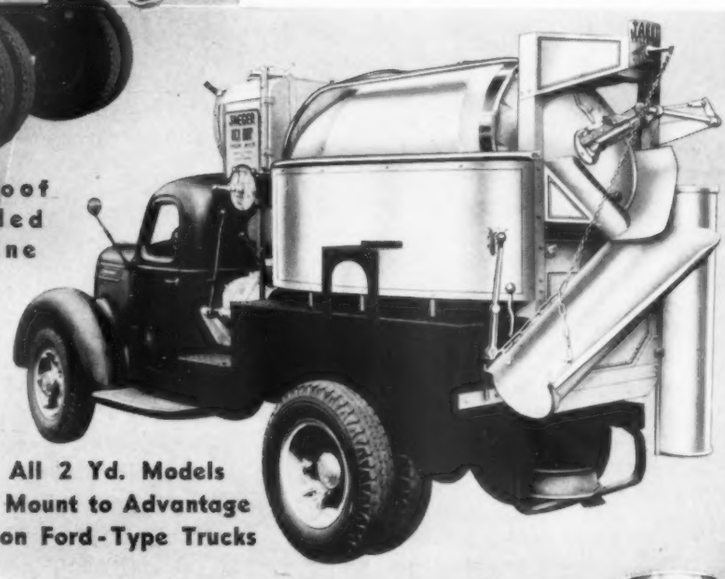
Only JAEGER Equips You to Meet EVERY Ready-Mix Demand

1.

All Jaegers Have 2-Speed Shock-Proof Transmission—Vacuum Cab Controlled Truck Engine Drive or Separate Engine

Standard LOW CHARGE

Type: Lowest, most economical to load; fastest on the market to mix and discharge — produce maximum daily yardage of proven higher strength concrete. Sealed drum meets any specification. Sizes 2, 3, 4, 5, 5½ yds.



2.

All 2 Yd. Models Mount to Advantage on Ford-Type Trucks

HIGH DUMP Types:

(2) Top Loading Models with "Sealed Drum"

(3) Or Combination Top and End Loaders (Pat'd)

Far outselling all other high discharge truck mixers today because they are fastest to load, mix and discharge any slump concrete — and are the only high discharge truck mixers that meet every specification and job condition.

"Sealed Drum" Models take full load in one quick drop through the top. Fast Vacuum-Controlled Discharge Door seals against loss of moisture and heat in winter concrete.

Jaeger End Loading Hopper Attachment (specially adapted to older or temporary plants not equipped for ribbon loading) offers many advantages over all other end loaders — and does not interfere with use of Top Loading Door where specified by engineers. (See details at right.)

Both types are built in 2, 3, 4 and 5 yd. sizes.

3.

Jaeger Charging-Discharging Hopper Attachment Permits Top or End Loading in Order to Meet Conditions - - -

The only end-loader which does not constrict drum opening and slow up charging and discharge. One quick turn of hand wheel opens Discharge Gate — no need to move entire Hopper (requiring many turns of a wheel) — no second seal to leak or wear.

JAEGER PORTABLE HOPPER

Saves Truck Mixers Waiting—Means 25% More Pay-loads per Day on Average Job. Tows to job behind truck mixer — takes full 2 or 3 yd. batches. One hopper serves almost any job.

JUST OFF PRESS-- VITAL FACTS FOR READY-MIX PLANTS

Complete 1941 Data, Models, Specifications, Prices, Terms

THE JAEGER MACHINE COMPANY
602 Dublin Avenue, Columbus, Ohio

Send us newest information on ☐ Standard LOW CHARGE Truck Mixers, Agitators, ☐ HIGH DUMP Models, ☐ Portable Hoppers, ☐ Auto-Pavers and Spreaders, ☐ Pumps, ☐ Mixers, ☐ Hoists, ☐ Carts.

Name_____

The CONCRETE MANUFACTURER

books

for the CONCRETE MANUFACTURER

Concrete Industries Yearbook. 80 pages. Contains two chapters—"Concrete Units" and "Ready-Mixed Concrete." The section on "Concrete Units" completely covers the manufacture and merchandising of concrete-masonry units as well as pipe, tile, burial vaults, ornamentals, etc. The "Ready-Mixed Concrete" section covers the economics of the industry and deals with both popular methods of manufacture—central mixing, and central proportioning with mixing en-route. Plant design, operation, mixing and delivery control, supervision and administration are adequately covered, as is lime-putty.

Pit and Quarry Handbook (including the Directory of Cement, Gypsum, Lime Sand, Gravel and Crushed-Stone Plants). 792 pages, 8½ x 11½, 447 ill., 39 charts, 94 tables, cloth. Complete, concise and conveniently arranged technical reference work on all phases of designing, operating and maintaining non-metallic-mineral producing and manufacturing plants (cement, lime, gypsum, sand-and-gravel, crushed-stone, aggregates-bituminizing concrete products and ready-mixed-concrete). Accepted the world over as the standard authority.

Pit and Quarry Directory. (The Directory Section of the Handbook, published separately). Complete alphabetical and geographical lists of non-metallic-mineral producing and manufacturing companies and their plants. 254 pages, 8½ x 11½, paper.

Concrete Engineers' Handbook. By George A. Hool and Nathan C. Johnson. 800 pages. A compact reference book containing tables, formulas and data on plain and reinforced concrete. The standard authority for concrete engineers and should find a place in the library of every concrete-products and ready-mixed operator.

Basic Principles of Concrete Making. By Franklin R. McMillan. 99 pages. Mr. McMillan, who is director of research for the Portland Cement Association, undertakes a thorough, understandable discussion of the principles underlying efficient concrete mixing — a subject which many operators can profitably study.

Concrete Practice. By George A. Hool and H. E. Pulver. 369 pages. A simple, practical explanation of the best practices in the proportioning, mixing and placing of concrete; in the inspection and testing of concrete; in concrete construction methods, and in making estimates for concrete jobs.

Concrete Costs. By Frederick W. Taylor and Sanford E. Thompson. 709 pages, cloth. A comprehensive work covering the various factors which enter into the cost of concrete work. An invaluable reference book for the producer, contractor or engineer.

Concrete Work. By William K. Hatt and Walter C. Voss. (Two volumes) Vol. 1, 451 pages, is a book to aid the self-development of workers in concrete and deals with plans, specifications, details and precast concrete. Vol. 2, 206 pages, contains 97 job sheets devised to uncover the fundamental principles and operations of computing, selection of materials, mixing and placing concrete, upon which most of the applications of concrete are founded.

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Plain Concrete. By Edward E. Bauer. 364 pages. A detailed discussion of the production of concrete, covering every step from the selection and preparation of materials to placing, finishing and curing. Special emphasis is given to facts useful in the preparation of specifications and in testing concrete materials and finished concrete. Contains instructions for the performance of laboratory tests on materials and cured concrete.

Reinforced Concrete and Masonry Structures: 722 pages. The work of 14 specialists, this book offers a practical and detailed discussion of every important element entering into the design and construction of concrete and masonry structures.

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Your Name ..... Title .....

Firm Name ..... Address .....

Dependability COUNTS!

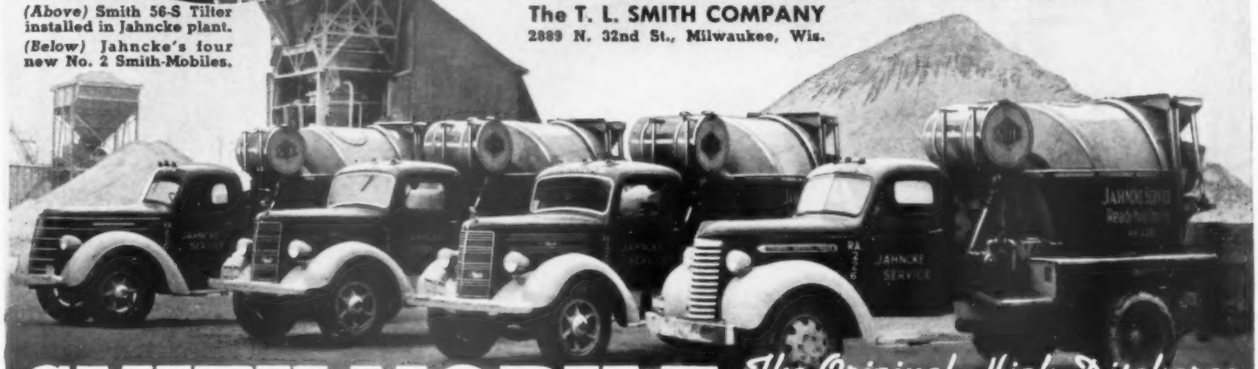
Old Smith Tilter Customer Orders Fleet of 4 Smith-Mobiles

The Jahncke Ready-Mixed Concrete Co., New Orleans, recently purchased four Smith-Mobile Truck Mixers. Why? Because they liked the HIGH DISCHARGE — the handy FEED CHUTE — the VISIBLE MIXING feature? Yes, but primarily because of the excellent, all-around performance of the Smith Tilting Mixers which Jahncke has been using for many years.

Jahncke knew that Smith-Mobiles were designed, built and guaranteed by the same company that built the famous Big Smith Tilters . . . knew also that Smith Engineers had a reputation at stake. They wouldn't dare put out an inferior product. No doubt about it, you can buy Smith-Mobiles with confidence . . . hundreds are now in successful operation . . . so why gamble with new, untried truck mixers?

(Above) Smith 56-S Tilter installed in Jahncke plant.
(Below) Jahncke's four new No. 2 Smith-Mobiles.

The T. L. SMITH COMPANY
2889 N. 32nd St., Milwaukee, Wis.



SMITH-MOBILE *The Original High-Discharge* **TRUCK MIXER & AGITATOR**

A 3476-½H

FLUE BLOCKS

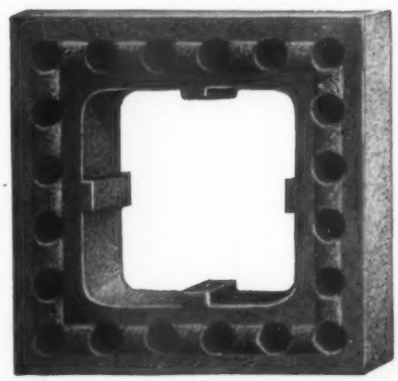
FOR FIRE-PROOF CONSTRUCTION

A big paying market and a low-cost product

when they are

MULTIPLEX-Made

Write for our Catalog No. 41 for full details about the MULTIPLEX Line.



The housing boom and industrial expansion mean *new opportunities* and *extra profits* for concrete products manufacturers. Builders and contractors are demanding "Made-by-Multiplex" flue blocks to insure economically produced units that meet every strength and safety specification in chimney construction.

MULTIPLEX concrete blocks are available in the following types: Standard Ventilated Type; Solid Type for Flue Liners; Light Weight Type for Flue Liners; the new 16" x 16" Ventilated Type for round Flue Liners.

All MULTIPLEX flue block machines now operating can be re-fitted to make the new type units.

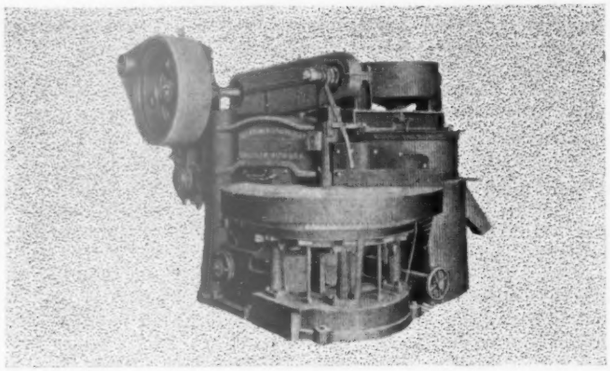
Better Chimneys and Better Profits are BUILT WITH MULTIPLEX!

The *Multiplex* CONCRETE MACHINERY CO., Elmore, Ohio

"It's really a BRICK!"

THE "J & C" PRESS

makes *better* Concrete Brick



Users say that they can make high quality concrete brick *faster* and *cheaper* on a "J & C" automatic machine.

All brick are accurately sized—have clean, uniform edges—are smooth textured, and high in strength.

Brick can be produced either vapor cured or high pressure cured. High pressure steam curing eliminates expense of yard stocking and aging. NO PALLETS USED.

Capacity of "J & C" Model "A" Machine, 3200 brick per hour. Capacity of Model "C" Machine, 1600 brick per hour.

Write for Information.

THE JACKSON & CHURCH CO.

Saginaw, Michigan

SPOT WELD YOUR MESH!

FOR GREATER STRENGTH

Welding cages with ALLAN Portable Welding Machine

with ALLAN Portable Spot Welder for welding concrete pipe reinforcement. This FAST, EASY, SURE, ECONOMICAL method *Reduces the* Cost of the product. Write for details

ALLAN MFG. & WELDING CO., Inc.
BUFFALO, NEW YORK

NEED STORAGE ROOM QUICKLY?

● Neff & Fry storage bins can be erected and ready for use within three days . . . giving you needed facilities **quickly.**

Check these features: super-strength, diagonal locking stave construction . . . steel hoop reinforced . . . immediate reaction . . . wide range of sizes . . . all guaranteed . . . easy dismantlement . . . thousands of actual installations to check for unbiased facts.

Write for full details

THE NEFF & FRY COMPANY
Camden, Ohio

DUAL PRIME **PUMPS**

IN QUARRY AND GRAVEL OPERATIONS!

30 M CMC Dual Prime furnishing water to gravel Washer for Tobin Quarries of Kansas City.
Write for NEW CATALOG on CMC Dual Prime Pumps from 1½" to 10". Also latest Mixers and Batching Equipment for products and pipe plants.

CONSTRUCTION MACHINERY CO., WATERLOO, IOWA

It is better to own a Sherman machine than to compete with one.

SHERMAN'S

Ball Bearing Concrete Pipe Machine, showing the sectional core which is the most economical core. By replacing only one section at a time which is a savings of 75% to the user.

Write for Prices and Information

SHERMAN CONCRETE PIPE CO.
KNOXVILLE, TENN.

Lewistown Foundry Products
ARE

Performance-Tested

BUCKET ELEVATORS
REVOLVING SCREENS
CRUSHERS DRY PANS

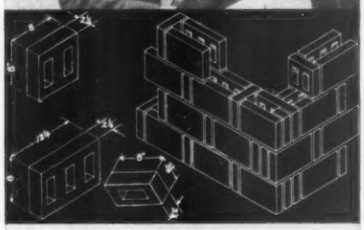
Lewistown Foundry & Machine Co.
Lewistown, Pa.

The 28th Ransome for ONE OPERATOR

This group of Ransome Truck Mixers

includes the 28th Ransome in this operator's fleet. Confidence in Ransome performance is reflected in repeat orders such as this. When next considering truck mixers it will pay you to investigate Ransome.

RANSOME CONCRETE MACHINERY COMPANY
DUNELLEN NEW JERSEY



How Sumpter Solves HIGH PRICES AND MATERIAL SHORTAGES

Are the builders in your community hampered by delays, rising material prices, uncertain quality? Mr. W. A. Sumpter solved these problems by producing better, lower cost building materials from locally obtained aggregate.

He makes DUNBRIK a lighter weight, lower cost brick of greater strength, lower absorption, and DUNSTONE a double and triple brick that enables him to build fire and vermin proof walls at cost level of frame.

Mr. Producer: You, too, can solve these problems for the building industry in your locality. You use your surplus or waste aggregate and make products in a range of over 40 beautiful colors, shades and textures.

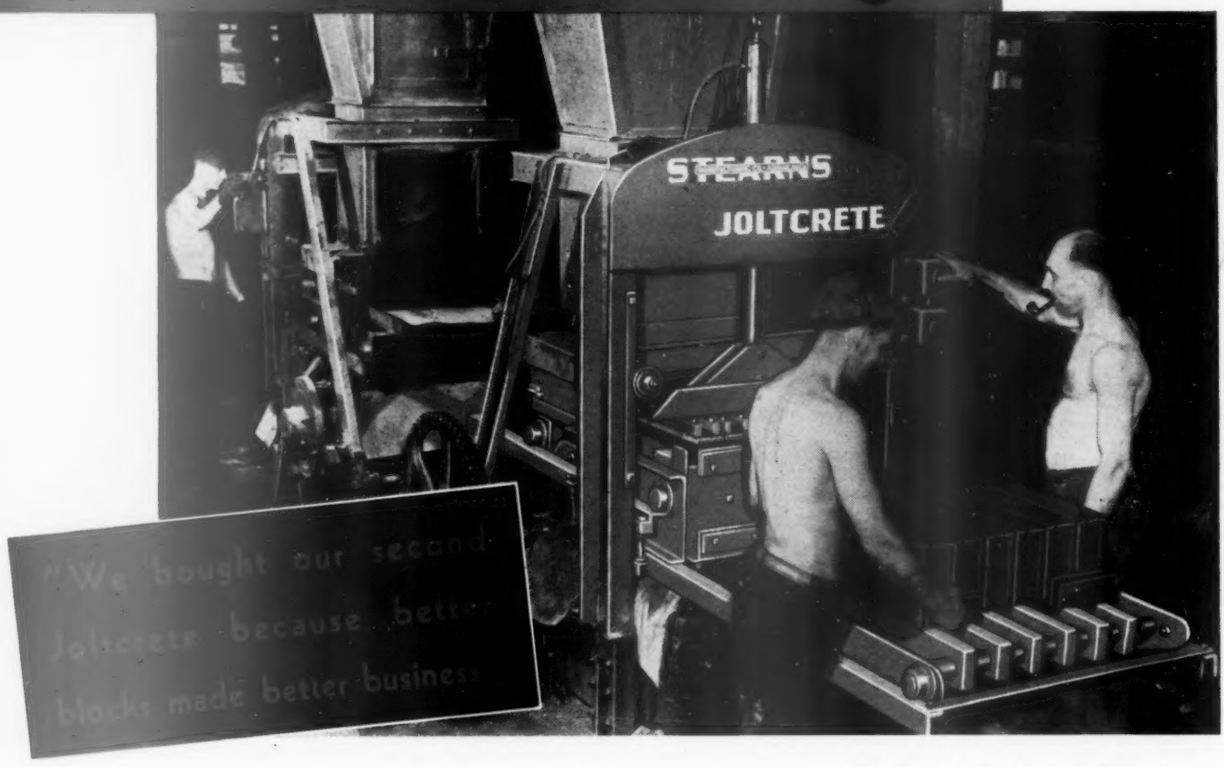
Many producers like Gravel Products, Consolidated Quarries, Chandler Materials, C. L. Nelson Co., and others are now supplying some of today's largest Defense jobs with millions of DUNBRIK and DUNSTONE. We will equip you with a modern line production plant that can be operated with a small crew.

Modest investment starts you. Terms can be arranged, and your territory will be protected by franchise. Write or wire today for free books that tell the complete story.

W. E. DUNN MFG. CO.
420 W. 24th St. Holland, Michigan

The CONCRETE MANUFACTURER

ONE wasn't enough!



Two Joltcretes operating in one of the best managed concrete products plants in the country, that of Harrisburg Building Units Co., Harrisburg, Pa.

"The better quality, appearance and salability of the units made on our first Stearns Joltcrete machine made our business better and necessitated the installation of a second Joltcrete to meet the increased demand," writes R. R. Bowman, Manager, Harrisburg Building Units Co.

That's why Stearns Joltcrete block plants the country over are getting the cream of the block business—that's why twenty-seven of them have installed their second Joltcretes, four of them their **third** Joltcretes!

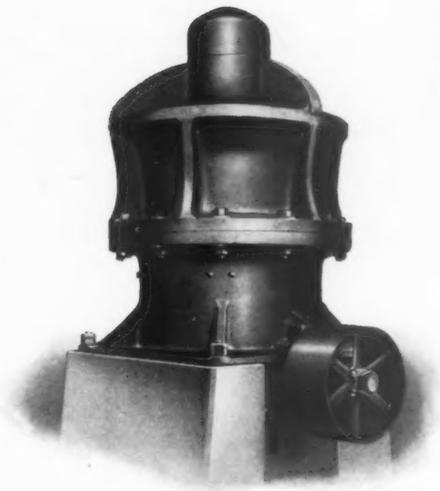
•

Write for a Joltcrete folder. Learn how this patented process—Limited Amplitude Vibration (Vibration Under Pressure)—is adaptable to any type of aggregate and any design of unit.

Makers and users of infringing machines will be prosecuted

STEARNS
MANUFACTURING CO. - ADRIAN, MICH.

When you buy a block machine, Buy a Machine of Proven Worth!



TRAYLOR TY REDUCTION CRUSHER

INVESTIGATE OUR TYPE H BLAKE CRUSHER (BULLETIN 1105), AND OUR MULTI-STAGE FINE REDUCTION CRUSHER—(BULLETIN 113).

THE reduction machine with all of the TROUBLES LEFT OUT, and incorporating all DESIRABLE FEATURES—Maximum Strength (all steel construction); Simplicity of Design; Scientific Automatic Lubrication; Absolute Dust and Grit Exclusion; Protection Against Breakage by Tramp Iron; AND Traylor Original Non-Chokable, Self-Tightening Bell Head and Curved Concaves. The Head and Concaves and several other features are patented.

In other words, the "TY" has "what it takes," in fact, has been "taking" it in hundreds of plants during the past few years, in many cases handling jobs that other reduction crushers have failed at. Users include mining plants, gravel and crushed stone plants, cement and lime plants, chemical plants and various other process industries. Many remarkable records of low production costs have been made in these locations.

You should investigate this crusher. Its price is moderate, compared with the profits you'll gather in. Bulletin 3112 "tells all." Write for a copy, NOW!

TRAYLOR
ENGINEERING & MANUFACTURING CO.
MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

NEW YORK CITY, 3916 Empire State Bldg. — CHICAGO, 2051 One La Salle St. Bldg. — SALT LAKE CITY, 101 West Second South St. — LOS ANGELES, 919 Chester Williams Bldg. — SEATTLE, 6311-22d. Ave. N. E.

B. C. EQUIPMENT CO., LTD., 551 Howe St., Vancouver, B. C. — MANILA MACH. & SUPPLY CO., INC., Manila and Baguio, P. I. — MAQUINARIA INTERNACIONAL, S. R. L., Av. Francisco I. Madero No. 17, Desp. 214, Mexico, D. F.

Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Antofagasta, Oruro, San Juan, P. R.

To see a LIMA in rock is proof that there is no better shovel made for rock digging. Why? Because the design is right. The truck and revolving bases are both steel castings, especially designed to withstand the severe shocks imposed upon them in hard digging; the chain crowd is positive with power to hold the dipper to the work without coaxing; the big husky engine—gasoline, Diesel or oil—has the power that guarantees big output, and the front-end equipment—boom, dipper handle and dipper—have been proved dependable on the toughest rock jobs all over the country.

In addition to the above advantages, LIMA quarry shovels have roller bearings throughout, helical cut gears and a clutch control that makes operating a pleasure.

For your own protection, better make your next excavator a LIMA.

LIMA LOCOMOTIVE WORKS, Inc.
SHOVEL and CRANE DIVISION, - LIMA, OHIO

NEWARK, N. J. NEW YORK, N. Y. DALLAS, TEXAS PORTLAND, ORE. PHILADELPHIA, PA. SEATTLE, WASH. SPOKANE, WASH. SAN FRANCISCO, CALIF. LOS ANGELES, CALIF. MEMPHIS, TENN. MONTREAL, Quebec, Can. VANCOUVER, B. C.

LIMA DESIGNED THROUGHOUT FOR ROCK DIGGING

LIMA TYPE 750
OWNED BY
DENNI INVESTMENT COMPANY
WILMINGTON, CALIFORNIA

BIG SHOT OR BIRD SEED?

—*you make the choice*

Ever know a top executive who didn't get around? Well, that's your cue now. You have never needed a fresh outlook more—with the comfortable old world falling about your ears. What are you going to do about it?

Hundreds of the brightest minds in business are getting together in September at the Royal York Hotel, Toronto, Canada, for the annual N.I.A.A. Conference.

Many of them are working now to bring you their interpretation of today's perplexing problems of industrial marketing. You could not buy this wealth of experience for a fortune.

Yet it is all yours for the price of a registration ticket, train fare and three days' hotel. Make up your mind to be in Toronto on September 17 and send in your registration now.

- It is easy for United States citizens to come and go across the border — no special forms or red tape required.
- The Royal York Hotel is the largest in the British Empire—all sessions, exhibits and panels on the one convention floor.
- Canadian industry has had to face for two years the conditions now confronting us. This experience can help to steer you straight.
- Some subjects on the Program: Industrial Advertising in a Wartime Economy — Institutional Advertising — Information Plus—Industry Looks Ahead — Advertising Analysis—Putting Sales Tools to Work—and many others.

Make this note in your diary

19th ANNUAL N.I.A.A. CONFERENCE

TORONTO, CANADA-SEPTEMBER 17, 18, 19

NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION, INC.
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FINISH THE JOB
WITH A
BAUGHMAN
LIMESTONE SPREADER

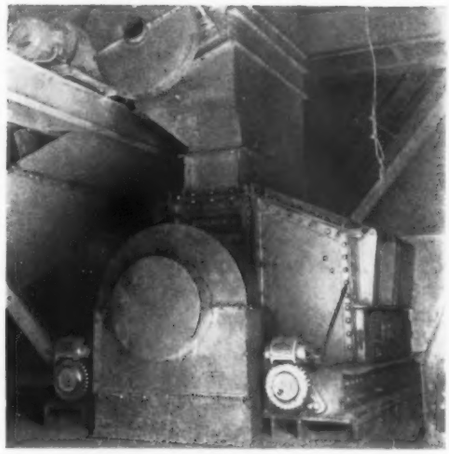
Be sure that your production of agricultural limestone is correctly applied. Baughman spreaders will do it. Even distribution of limestone up to 40 ft. width is assured by the spreading action of a specially-designed revolving disc.

The illustration below shows two 7½ ton Baughman MAMMOTH limestone spreaders at work. Notice how the spread is held down to the ground where it belongs and also the width of the spreads. These two machines have spread thousands of tons of lime and are still going strong.

Baughman limestone spreaders are made in models that can be attached to flat or dump trucks. The new, improved MAMMOTH carrier and spreader comes in seven models ranging from 6 to 18 tons. Each model is a self-contained unit with built-in drives and controls.

Write for our literature

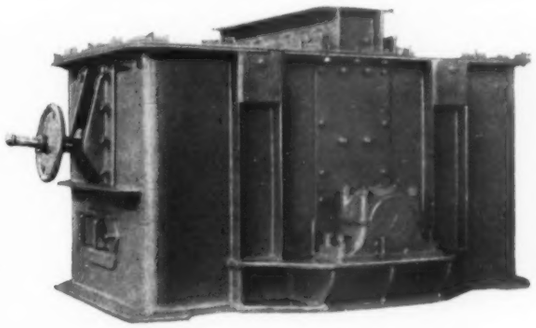
BAUGHMAN MANUFACTURING CO.
Specializing in Spreading Equipment
JERSEYVILLE, ILLINOIS



"PENNSYLVANIA"
REVERSIBLE
HAMMERMILLS

modernize the secondary preparation of Cement-making and similar materials, by major impact crushing, in alternate right and left-hand operation—which affords,

- Automatic Hammer Turning and Resharpening,
- Crushing more stone finer at less H. P. per ton,
- Boosting output of grinding equipment,
- Sharply reduced maintenance costs.



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REVERSIBLE
IMPACTORS

prepare abrasive materials, including **Refractories, Flint, Gravel, Ores, Sinters, Glass Fluxing Minerals,** etc., by smashing impact without attrition—to premium particle size and shape, with minimum fines.

Impact crushing requires closed circuit operation for accurately sized products.

• Put your Reduction Problems up to us, for cooperative study and recommendation

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***NEWEST* DOWNTOWN HOTEL**

Hotel Auditorium

In the heart of the downtown business section, just across the street from the famous Public Auditorium. Near all railroad stations. 300 comfort-planned rooms with private bath (tub or shower). Popular-priced Coffee Shop, Dining Room and Alpine Tavern. Garage adjoining hotel.

RATES FROM $2 SINGLE $3.50 DOUBLE

Frank K. Cannon, Manager

"WE FIND THE DOUBLE HINGE A DECIDED ADVANTAGE IN HARD DIGGING AND WET EXCAVATION."

Eugene F. Verga, Inc., New Jersey Contractors, writes:

"Your new type welded rolled steel constructed Multiple Rope Bucket is *most satisfactory in every respect.* In sewer excavation, the double hinge is a decided advantage due to longer spread of spades."

The stronger, weight saving, welded construction and the many mechanical features developed in designing and building buckets since 1906, make Williams Buckets without a superior for hard service.

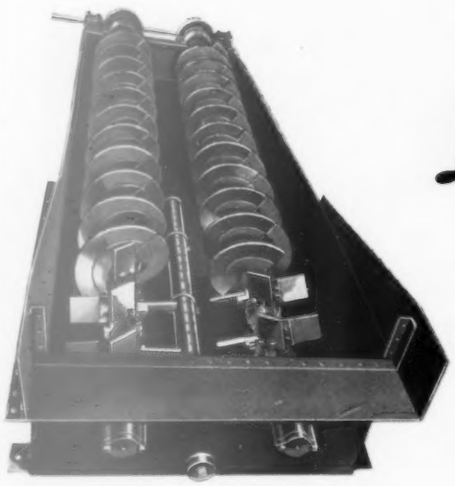
Note how Williams sheave design keeps cable leads straight, avoiding side friction and wear.

Distributors in all parts of the country, ready to give fast service. Descriptive bulletin FREE on request.

THE WELLMAN ENGINEERING CO.
7014 Central Ave., Cleveland, O.

WILLIAMS *Buckets*
***built by* WELLMAN**

EAGLE Equipment



Eagle Double Screw Washer partially equipped with paddle type flights. Washers available in wide range of sizes.

Leads the Parade

in "Producer-Popularity"

More EAGLE machines were sold in the first three months of 1941 than in all 1940!

. . . **because** Sand and Gravel Producers know that current defense measures put a premium on strictly first-class cement.

. . . **because** EAGLE Washing and Dewatering Equipment is identified with the slogan, "Good Cement demands Clean Aggregate."

. . . **because** material processed by EAGLE machines meets every specification.

Write for our new Bulletin No. 41

EAGLE Products Include:

EAGLE Double Roll Crusher
EAGLE Shale Planer
Olson Self-Dumping Cages
Specialized Mining Equipment
EAGLE Dry and Wet Pans
EAGLE Grinder

EAGLE IRON WORKS
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YOUR SOURCE OF SUPPLY

FOR LIGHT-WEIGHT PIPE

● For high or low pressure service, you can depend on Naylor light-weight pipe to deliver the plus performance that spells economy in your pipe lines.

Naylor has geared its production to help you avoid possible costly delays in obtaining light-weight pipe—to give you a dependable source of supply in today's complex market.

At the same time, you get all the extra advantages of Naylor's exclusive Lockseam Spiralweld structure—greater strength, safety and savings. Sizes from 4″ to 30″ in diameter. All types of fittings and connections.

Write for Complete Catalog

NAYLOR PIPE COMPANY
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CHICAGO, ILLINOIS

NAYLOR LOCKSEAM SPIRALWELD **PIPE**

The MORRIS HYDRAULIC COLUMN

News of interest to Centrifugal Pump Users

Why buy
Morris Centrifugal Pumps
and Hydraulic Dredges
for sand and gravel?

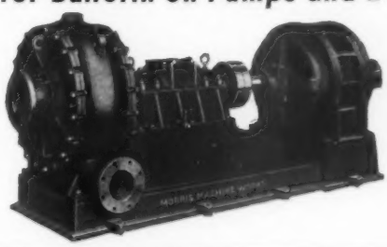
Because, firstly,
Morris
has specialized
on building
pumps for
difficult services
for 77 years.

Secondly,
Morris makes
the largest line
of pumps for
handling abrasives.

And thirdly,
because of Morris
performance records.
They're remarkable
and convincing.

So, always get
a Morris quotation
when you need
centrifugal pumps
or dredges
for handling
sand and gravel.

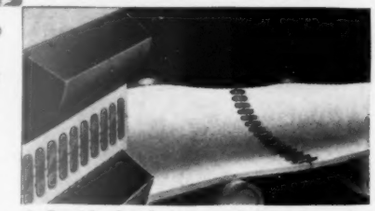
Write for Bulletin on Pumps and Dredges



For authoritative recommendations on any pumping or dredging problem, write to Morris Machine Works, Baldwinsville, N. Y. Representatives in Principal Cities.

Keep your conveyor belts going with FLEXCO HD BELT FASTENERS

• **FLEXCO H D RIP PLATES** are used in repairing rips and patching conveyor belts. The wide space between outer bolts gives the fastener a long grip on the edges of the rip, while the center bolt prevents the fasteners from bulging.



• Avoid shutdowns and lengthen the life of your conveyor belts and bucket elevator belts by using Flexco HD belt fasteners and rip plates. Thousands of companies have stepped up the performance of conveyor lines and cut costs by using Flexco methods.

• **FLEXCO H D BELT FASTENERS** make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Six sizes in steel and alloys.

Bulletin F-100 shows exactly how to make tight butt joints in conveyor belts with Flexco HD Belt Fasteners. Also illustrates step by step the latest practice in repairing rips and putting in patches.

FLEXIBLE STEEL LACING COMPANY
4623 Lexington St., Chicago

Write for your copy

FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

DEFENSE *Against* WEAR

The 14% manganese-steel dragline-bucket dipper tooth shown at the left was protected against wear by a coating of Coast Metal No. 112 on its exposed faces. After having given several times the normal service expected from an uncoated tooth, it has been removed to receive another application of Coast Metal. Note how the beads of Coast Metal have stood up under severe service. Parts and equipment are becoming increasingly hard to get . . . let Coast Metals give your present machinery a new lease on life. Get all the facts now!

COAST METALS INC. Canton, O.

NEW EQUIPMENT means LOWER COST DIGGING!

1500 Rolled Alloy Steel EXCAVATORS HAVE CONCLUSIVELY PROVED THAT P&H'S MODERN DESIGN IS FAR AHEAD — Superior

Why cling to that old shovel? Why rob your profits to pay repair bills? The exclusive rolled alloy steel construction of P&H excavators means more dependability, greater production—and extra strength to resist the wear and tear of year-after-year operation.

Ask also about P&H's new hydraulic control. It's simpler, more positive and as smooth as steam!

Capacities from 3/8 to 5 cu. yds. Gasoline, Diesel, electric power. Literature available on all models.

General Offices: 4451 W. National Avenue, Milwaukee, Wisconsin.

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EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

The above screening plant turns out 400 tons of graded aggregate per day and is kept supplied with raw material from a gravel bar by a 3/4 cu. yd. Sauerman Slackline Cableway.

SAUERMAN efficiency means greater economy and higher PROFITS!

Excavating and stockpiling is simplified by using a SAUERMAN Drag Scraper or Cableway.

These machines dig, haul and dump in one economical straight-line operation. Readily adaptable to varying digging conditions, they will move a given yardage in less time than any other machines of comparable price.

Because they require but a single operator, consume little power in operation, and require practically no maintenance, they are extremely profitable to use.

Here is a 3 cu. yd. Sauerman Scraper that delivers 2,000 tons of gravel per day from hill to plant conveyor.

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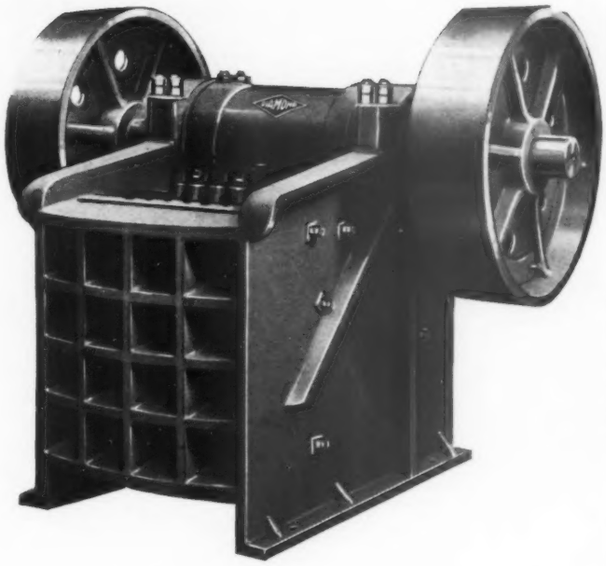
SAUERMAN BROS., Inc.
434 S. Clinton St. CHICAGO

Sauerman LONG RANGE MACHINES



DIAMOND Crushers are built for high production at low cost

DIAMOND long jaw design is responsible for high, uninterrupted production and unfailing uniformity. A highly efficient face contour assures positive grip and crushing effect on the upper or feed end of the jaws. This curve at the lower or discharge end of the movable jaw creates a parallel action of the stationary jaw and produces a uniform product.

Whether for primary breaking or for the production of fines, there's a rugged, high production DIAMOND jaw or roll crusher in a size to meet your requirements.

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Will gladly help you work out in the most economical manner any crushing, screening and conveying problems that may confront you. Their skilled service is at your command, and we will welcome your inquiry and give it immediate attention. No obligation, of course.

JAW CRUSHERS
ROLL CRUSHERS
VIBRATING SCREENS
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CONVEYORS
ELEVATORS
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Marvels of flexibility, high efficiency and economical operation, DIAMOND portable plants are built in a wide range of sizes and capacities. DIAMOND plants embody many exclusive and patented features, all making for easy portability, fast, uninterrupted, low cost operation and long years of dependable service.

ASK US—DON'T BE SATISFIED WITH LESS THAN THE BEST!

ASK for bulletins covering any items of interest. They will be sent promptly. And remember, our engineers will gladly offer their suggestions.

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ESTABLISHED 1890
DIAMAHR
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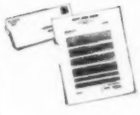
MINNEAPOLIS, MINNESOTA, U. S. A.

BEST FOR "CATS"

SAY PIOMBO BROTHERS, SAN FRANCISCO, CALIF., CONTRACTORS



"During the many years that Piombo Bros. & Company have been in the contracting and construction business in the San Francisco Bay area, we have never found a lubricant that would begin to compare with LUBRIPLATE No. 30 for application to our Caterpillar tractors and other construction machinery.

"During a recent large highway job where we had seven of our Caterpillar tractors in service, LUBRIPLATE had an excellent opportunity to show up its real efficiency in transmissions, final drives and track rolls.

"LUBRIPLATE No. 30 has given us such excellent satisfaction, that we are indeed pleased to recommend its use in Caterpillar tractors."

(Signed) L. PIOMBO

Piombo Bros. lubrication truck carries LUBRIPLATE lubricants in convenient dispensing drums. Resistance to wear, heat and moisture makes LUBRIPLATE lubricants last longer.

YOU TRY IT Best for "cats" and every use. There's a LUBRIPLATE lubricant for every job. Our field engineer will be glad to call and give you complete information as to how LUBRIPLATE can save you money. Try it.

LUBRIPLATE DIVISION
FISKE BROTHERS REFINING CO.
NEWARK, N. J. TOLEDO, OHIO

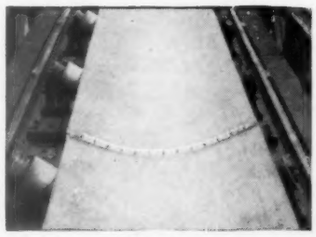
DEALERS FROM COAST TO COAST

LUBRIPLATE
THE MODERN LUBRICANT
THAT ARRESTS PROGRESSIVE WEAR

LUBRIPLATE

Talcott Belt Fasteners

FOR CONVEYOR ELEVATOR AND TRANSMISSION BELTING



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for SAFETY
STRENGTH
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ECONOMY
Insist on
TALCOTT
the
EASY FASTENER
TO APPLY

Send for Samples

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Today's rigid specifications insist upon uniformly crushed material, free from chips or slivers. That's the kind of material American Crushers will produce for you . . . day after day, year after year . . . with low maintenance cost, high output and low power consumption. American Crushers have been operating **continuously** for an army of experienced users. Get all the facts by writing to:

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Uniform Separation

The new model GAYCO Centrifugal air separator makes possible the uniform and increased recovery of cement and other extremely fine materials within a range of 60 to 400 mesh.

- Greater Capacity
- Cleaner Tailings
- 99% Through 325 Mesh
- 25% to 30% greater recovery of fines.
- Not affected by variation in speed or rate of feed.

Manufacturers also of "Reliance" Crushers, Screens, Elevators, Conveyors, Bin Gates, Grizzlies. Complete crushing, screening and washing plants for crushed stone, sand and gravel.

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Canadian Representative: F. H. Hopkins & Co., Ltd., Montreal

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Chains	Portable Loaders	Coolers
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SCHRAMM

AIR COMPRESSORS

Built in sizes ranging from 20 to 600 cubic feet. Can be obtained in any type mounting—Portable or Stationary.

Further information upon request.

SCHRAMM, INC., West Chester, Pa.

A BIG *full* LOAD WITH EACH BITE

Because of their design and construction, Industrial Brownhoist clamshell buckets take extremely full loads with each bite, practically eliminate the need for hand shoveling, speed up material handling and cut handling costs. Quantity production plus our manufacturer-direct-to-you policy reduces your bucket investment. Write today.

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DAVENPORT Rolls all over the World LOCOMOTIVES

STEAM • GASOLINE • DIESEL **LOCOMOTIVES** MECHANICAL or ELECTRIC DRIVE

—by putting modern Davenports on the job. These easy handling, powerful locomotives do pleasing things to your books —when you figure out the relation between Output and Costs. For more than forty years we have been building fine locomotives. That's why—in dependability, low upkeep, and ability to get things done—Davenport Locomotives are your best buy.

Submit your requirements to Davenport engineers for reliable recommendations. That's a step in the right direction.

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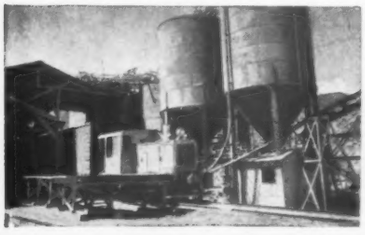

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A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA

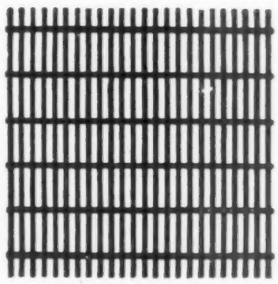
Screening . . . . . to Assure Better Cleaning!

Quartzite for keeping spark plugs clean is screened to assure high product quality!

This Link-Belt vibrating screen removes oversize from quartzite which is used to clean spark plugs. Equipped with a 28-mesh stainless steel wire cloth, and driven by a 1 H.P. motor, this screen protects the quality of the product and assures satisfying results for those who buy it. In countless other applications, Link-Belt vibrating screens are doing an effective job at low cost. Their economy and smooth, dependable performance have won the preference of production men everywhere. Write today for Book No. PQ-1702 and see how you can save money and improve production with Link-Belt screens.

LINK-BELT COMPANY 8344
307 N. Michigan Ave., Chicago

WRITE TODAY! ***LINK-BELT Vibrating Screens***



Rolled Slot

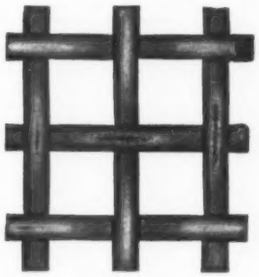
ALLOY No. 2

A super wearing Steel developed to resist the abrasion and vibration of modern screening demands.

"CLEVELAND" SCREENS

A wire cloth of guaranteed accuracy backed by fine workmanship and an effort to satisfy.

Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.



2 Mesh .162 Ga.

THE CLEVELAND WIRE CLOTH & MFG. COMPANY
574 E. 78th St. CLEVELAND, OHIO

★ Rock Drills
★ Air Compressors
★ Pneumatic Tools
★ Electric Tools
★ Diesel Engines
★ Diamond Drills

CHICAGO PNEUMATIC TOOL COMPANY
6 East 44th Street, New York, N. Y.
Sales and Service Stations Throughout the World

ROUND
SQUARE
SQUAROUND*
HEXAGON
PERFORATED PLATE
of every description
for maximum productiveness from your vibrating screens.
*Reg. U. S. Pat. Off.

HENDRICK MANUFACTURING CO.
39 Dundaff Street, Carbondale, Pa.
Sales Offices in Principal Cities. Please Consult Telephone Directory

IT'S NO TIME TO EXPERIMENT!

Steady production—rush jobs—demand the best in screen cloth. Stick to "Twin City" Alloy Screen for accuracy, resistance to abrasion, and long wear.

TWIN CITY IRON & WIRE CO.
21 W. WATER ST. ST. PAUL, MINN.
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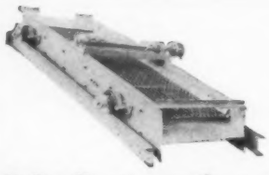

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Single and double roll and jaw crushers, hammer mills, super dry pans, — steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists, — complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

McLanahan & Stone Corporation
Continuously in Business Since 1835
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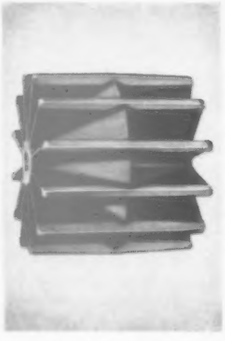


DOUBLES THE LIFE OF CONVEYOR BELTS!

The most profitable investment in conveyor equipment! A pulley that saves at least 50% on conveyor belts! This exclusive Sprout-Waldron development prevents material from coming between the face of the pulley and the belt . . . eliminates the heavy friction wear and punching of holes. Interchangeable with standard pulleys. *Write for list of sizes available.*

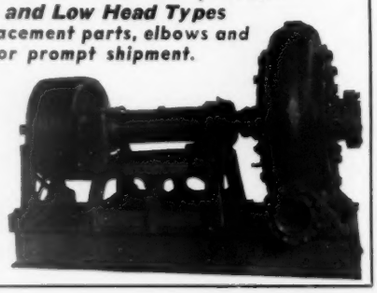
SPROUT, WALDRON & CO. INC.
136 SHERMAN ST. MUNCY, PA.
ELEVATORS, CONVEYORS, POWER TRANSMISSION EQUIPMENT

LOOKING FOR USED EQUIPMENT?

Refer to the listings in the Broadcast Section in this issue for a wide variety of used and surplus machinery and supplies.

LIGHTNING
Sand and Gravel Pumps
Heavy-Duty (Ball-Bearing) and Low Head Types
Complete stock of replacement parts, elbows and fittings carried for prompt shipment.

Also clear water pumps for general service, modern design, lowest cost. High efficiency means low operating costs. Replacement parts always fit. We build abrasive material, handling pumps from 10" down to 3" in size.



KANSAS CITY HAY PRESS CO.
KANSAS CITY, MO.

FOR SALE

16 inch dredge, now pumping 150,000 yds. sand and gravel per month, located in North Mississippi. Available after August 1, 1941. Hull—steel, 24 ft. x 76 ft. x 5 ft. Ladder—65 ft., 16 in. AMSCO extra heavy duty counter flow pump, directly connected to 600 HP Westinghouse variable speed 2300 volt motor. Fully equipped with priming pump, high pressure pump for breaking down banks, etc., 5000 ft. pipe, submarine cable, pontoons, etc. Extra new shell, impeller, cutter head, etc.

KOCHTITZKY & JOHNSON
Avalon, Mississippi

FOR SALE

DUMP CARS: Two Clark 30 cu. yd. capacity Air Dump Cars, good condition.

Smith 56-S Tilting Type Concrete Mixer, 2 cubic yard capacity, excellent condition.

E. E. FORT

1119 S. 56th St. Philadelphia, Pa.

CRUSHERS—ELEVATORS—SCREENS
SAND WASHERS—PUMPS—CONVEYORS

1—4″x12″ WHEELING No. 2 Jaw Crusher.
1—BRAND NEW Jaw Crusher 9″x15″.
1—8″x15″ CLIMAX No. 1½ Jaw Crusher.
1—9″x16″ CLIMAX No. 2 Jaw Crusher.
3—12″x26″ CHAMPION No. 6 Jaw Crusher.
1—10″x16″ NEW HOLLAND 4 roll crushers.
2—Sets STURTEVANT Balanced crushing rolls 21″x 10½″ and 36″x16″.
2—M-20 QUAKER CITY Hammer Mills.
1—No. 1 STURTEVANT Open Door Rotary.
1—24″ wide LINK-BELT Apron Feeder.
Cranes, Shovels, Hoists, Motors, etc. Sales & Service on UNIVERSAL CRUSHER CO. products.

JOHNSON AND HOEHLER, INC.
LANSDOWNE, PENNA.

FOR SALE

1—Stiff legged steel derrick, 10-ton capacity, 40′ mast, 75′ boom, steel lattice construction, equipped with 3-drum Clyde hoist with independent swinger, and 1-cu. yd. Blaw-Knox clam shell bucket. Without motor.

1—Stiff legged steel derrick, 10-ton capacity, 40′ mast, 75′ boom, steel lattice construction, equipped with National 3-drum hoist with independent swinger, and 1-cu. yd. Blaw-Knox clam shell bucket. Without motor.

For further particulars address

American Zinc Company of Tennessee
Mascot, Tennessee

PENNSYLVANIA CRUSHERS

Quick sale, four 18″x24″ Steel-built Pennsylvania heavy duty Single Rolls for Limestone, Lime, Clinker or Coal; one SX-4 Steel-built Trojan Hammermill. All excellent condition.

PENNSYLVANIA CRUSHER CO.
Liberty Trust Bldg. Philadelphia, Pa.

Rebuilt Equipment

BALDWIN 58 ton 6 wheel switcher, 19x24″ cyl. Walscheart valve gear.
DAVENPORT 22 ton 4-wheel Saddle Tank; Cyl. 11x16.
PLYMOUTH 12 Ton 36″ Ga. Gasoline Locomotive; Hand Brakes.
3 PLYMOUTH Model FL, 24″ Ga. Gasoline Locomotive.
1 WHITCOMB Model CS-4, 4½ Ton, 24″ Gauge Gasoline Locomotive.
P&H Model 450 one yard combination shovel and crane, Waukasha gas motor.
UNIVERSAL-LORAIN Model 35, ½ yard combination shovel, crane and dragline.
½ Yard BLAW-KNOX clam shell bucket.
1½ Yard HAYWARD clam shell bucket.
WILLIAMS ½ yard clamshell bucket.
10—BUDA Model 119 and Model 19-L motor section cars for standard gauge track, Buda air cooled gasoline motor.

Write for Complete List
SOUTHERN IRON & EQUIPMENT COMPANY
Plant & General Offices
Atlanta, Georgia

FOR SALE

BIN, 35 ton Blaw-Knox, steel	$ 900.00
CONVEYOR, 20′x14″ belt feed	385.00
CRUSHER, 9x36 Cedar Rapids, Rebuilt	1600.00
DRILL SHARPENER, Sullivan Class C	400.00
WAGON DRILLS, Cleveland DR-8, Reconditioned	900.00
TRUCK SCALE, Winslow 12 ton, 18′x9′	300.00
SHOVEL, ⅜ yd. Insley, half swing	1500.00
SHOVEL ATTACHMENT, Model 4 Northwest	1500.00
TRACTOR & BULLDOZER, Caterpillar "30"	750.00

Write or wire for full particulars
O. B. AVERY COMPANY
Macklind at Manchester, St. Louis, Mo.

FOR SALE

25-Ton 0-4-0 Davenport Loco., S. G. NEW FLUES. EXCELLENT CONDITION. Immediate Delivery.

1—48-ton 0-6-0 Baldwin Fireless Loco. Built 1922. Good condition.

2—42-Ton 0-4-2 S/T Oil Burner Locos. A.S.M.E. BOILERS. New 1919, used only 4 years.

SEND US YOUR INQUIRIES FOR ANY KIND OF LOCOMOTIVES.

IRON & STEEL PRODUCTS, Inc.
36 years' experience
"ANYTHING containing IRON or STEEL"

You can't start work on any kind of a construction job until you have the tools to work with. Neither can one sit idly by waiting for delivery promises to materialize. The solution to the problem is to buy REBUILT and REGUARANTEED equipment and machines from us. WE DELIVER NOW. Here are a few items from our $1,000,000 stock of equipment. Send for our 64 page stock list.

AIR COMPRESSORS:

30—Portable gasoline driven air compressors all makes—sizes 310′, 260′, 220′, 160′, 110′.

BINS:

9—1—150-ton Blaw-Knox, 1—118-ton Blaw-Knox, 1—117-ton Blaw-Knox, 1—72-ton Blaw-Knox, 1—75-ton Butler, 1—51-ton Blaw-Knox, 1—35-ton Blaw-Knox, 2—30-ton Johnson offset bins all with or without weigh-batchers, and are 2 comp. bins.

CABLEWAYS:

1—Lidgerwood 15 ton cap. cableway, 2300′ span, with Lidgerwood 12¼x15 steam hoist, with or without steel towers.

CRANES, DRAGLINES AND SHOVELS:

1—Link-Belt K-55, Serial No. 1698, 70′ boom, 2 yd. bucket, also have 2 yd. shovel attachment.
1—Link-Belt K-48, Serial No. 1728 with 60′ boom, 2 yd.
1—Northwest Model 5, Serial No. 3572 with 50′ boom, 1½ yd.; also pull shovel 1¼ yd. and
3—Northwest Model 4, Serial Nos. 3441, 3445, 3493 with 40′ boom 1 yd.; also 1-yd. pull shovel.
1—Northwest Model 104, Serial No. 2079, 45′ boom, 1¼ yd. bucket; with 1 yd. shovel attachment.
1—Link-Belt, Model K-42, Serial No. 1265, 45′ boom, 1¼ yd. bucket, also 1 yd. trench hoe attachment or 1¼ yd. shovel front.
2—Northwest Model 105, Serial Nos. 2556, 1645, 40′ boom, 1 yd. bucket with one shovel attachment.
3—Osgood Heavy Duty, Serial Nos. 2069, 2087 and 2403, 40′ boom, 1 yd. bucket and with 1 yd. shovel attachment.
1—Erie Gas-Air, Serial No. 4365 with 45′ boom and 1¼ yd. shovel attachment.
1—Thew, ¾ yd. Gasoline shovel with ¾ yd. shovel front and 40′ crane boom. Serial No. 2801.
1—Koehring Model 301, Serial No. 544, 40′ boom, ¾ yd. bucket.
1—Northwest No. 2 crane, new 1937 with 40′ boom.
1—P&H Model 206, Serial No. 1901, ¾ yd. 40′ boom.
1—Byers Bearcat Model No. 128, Serial No. 4119, ½ yd. cap. 30 ft. boom.
1—Byers Bearcat Model 27, Serial No. 5289, 30′ boom, ½ cl. sw. ½ yd. bucket.
1—Erie Steam Crane and Shovel with 40′ crane boom, with or without ¾ yd. shovel front.

PNEUMATIC TOOLS:

36—Rock Drills, mounting, wagon, column or tripod.
53—Jackhammers, various makes and sizes.

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ROCK CRUSHERS portable and stationary. 5 to 200 Tons per hour capacity.
REPAIR PARTS for all Acme Road Machinery Company products.

ACME ROCK MACHINERY CORPORATION
Frankfort, New York, U. S. A.

Crushers
Jaw—10x4, 10x7, 15x9, 18x12, 20x10.
36x24—A Farrel and 36x28 Traylor.
Gyratory—8" Traylor and No. 24 & No. 37 Kennedy.
54"x20" and 42"x16" Crushing Rolls.
Pennsylvania "Trojan" type Hammermill.

Vibrating Screens
3x4' 1-deck Leahys
3x6' 2-deck Leahy
3x5' 1-deck Multirap
4x6' 2-deck Leahys
3x5' 1 & 2-d. Hummers
3x6' 1-deck Leahy
3x5' & 4x5' New "Toncap" Hummer Screens.

Railway Equipment
8-ton 36"-gauge Whitcomb Gas Locomotive.
4-ton 36"-gauge Vulcan Gas Locomotive.
2—30"-g. Mercury Battery Locomotive.
36"-g. 4-yd. V-dump cars, hinged bodies.
36"-g. 3-yd. Koppel V-dump cars.
5—24"-g. 1¼-yd. Easton V-dump cars.
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1500' 24"-g. Portable Track and Switches.

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18"x44' B-G and 20"x45' Portable Types.
14" to 36" Rubber Belt, Idlers & Pulleys.
14" to 30" wide Gravity Roller Sections.
Gears, Shafts, Collars, Bearings, Etc.

Bucket Elevators: Open and Encased
5"x32', 7"x32', 8"x32', 10"x35', 12"x35', 14"x32', 14"x50', 16"x60', 20"x40', 24"x50'.
New Chain, Buckets, Belt, Steel Casings, Gears, Clutches, Sprockets & Take-Ups.
Malleable type AA Buckets, 24", 20", 12".
150 New Cast & Steel Transmission Pulleys.

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½-yd. Byers Gas Shovel, skimmer & boom.
Clamshell Buckets, ½, ¾, 1¼ and 1½-yards.
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No. 7 Pilediving & No. 2 Sheeting Hammers.
2000 Universal Form Clamps, ⅝" size.
800-hp. Patterson Hot Water Feed heater.
Hoskins Electric Furnace, 110/220-volts.

G. A. UNVERZAGT, 15 Park Row, New York City

FOR SALE

GYRATORY CRUSHERS: Gates, Allis-Chalmers, 5D, 7½D, 6D, 7½K; Austin-Western No. 5; Allis-Chalmers Superior No. 6.

LOCOMOTIVES Steam: 2—Baldwins 7-12—24" gauge; 2—Davenports 7x12—24" gauge; 1—Davenport 8x12—24" gauge; 1—Whitcomb 6-ton Gasoline.

REVOLVING SCREENS: 48"x12', 48"x16', 40"x16'.

Worthington 16x9x12 Steam Fire Pump.

75-KW Burke-Ridgway D.C. Steam Generator.

No. 104 Northwest Crane 50' boom.

225 KVA, 300 KVA Allis-Chalmers 3/60/2200 450 RPM Belt Driven Generators.

1—Allis-Chalmers synchronous motor 3/60/2200—375 HP 450 RPM.

22—Koppel V type cars, roller bearing, 2 yd. capy., 24 in. gauge.

1—Westinghouse non-condensing steam turbo-generator, 470 KVA—3/60/480 complete with exciter and switchboard.

CONTRACTORS EQUIPMENT CO.
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3—"Ruggles-Coles" Dryers, 54" dia., 20' long.
2—Steel Industrial Oliver Continuous Filters, 44x84x66", cylinder, 40x72"; 55"x8'6"x78", cylinder, 44x72".
2—Wooden Continuous Filters, Filtration Engineers; 12' long, 8'6" wide, 11' high, cylinder, 8'8"x6'; 12' long, 7'2" wide, 6'2" high, cylinder, 4'x10'.
3—Watson Mills, unlined, 2000 lbs. & 4000 lbs. capacities, with balls.
1—Auger Mill, Type 475, Internatl. Clay Machy. Co.
1—Plymouth 8-Ton Locomotive, Gasoline Driven.
5—Flat Cars; 3-Cubic Yard Dump Cars.
600 ft. Industrial Rails, 24 gauge.
Approx. 100-Tons 80 lb. Rails.
5—Broughton Mixers, ½ ton & 1 ton capacities.
2—Trunion Type Rotary Sand Screens, 12" double jacket.
1—Allis-Chalmers Crusher, 10"x24" rolls.
1—Traylor Crusher.
Also: Sand Pumps, Bucket Conveyors, Mills, Mixers, Filter Presses, Dryers, etc.

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Est. 1886

READY MIXED CONCRETE PLANT EQUIPMENT

1—Butler 150 ton, 3 compartment bin with extra Cement Compartment and Weighing Batchers.
1—Blaw-Knox One yard, three material, aggregate weighing Batcher with Beam Scales.
1—Johnson One yard Cement Weighing Batcher; Good condition.
1—Fuller Kinyon Cement Conveying System; capacity 140 bbl. per hour, with type C-40 Rotary Compressor; Gasoline engine drive; new in 1937 and used on one small job. Excellent Offering.

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1836 Euclid Ave.
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DERRICKS:

Excellent surplus equipment

Double and single laced mast complete with power, guys and turnbuckles

Mast 80 ft.: boom 70 ft. and mast 70 ft.: boom 60 ft.

A. JAY HOFMANN
NARBERTH, PA.
(In authority)

Jaw Crushers—4"x8" up to 66"x84".
Crushing Rolls—16"x10" up to 54"x24"
Gyratory Crushers—No. 3 up to Mammoth
Ring Roll Mills—No. 0, No. 1, No. 1½ and No. 2.
Swing Hammer Mills.
Rotary Fine Crushers—No. 0, No. 1, No. 1½ and No. 2.
Direct Heat Rotary Dryers—3½'x25', 4'x30', 5'x30', 5½'x40', 6'x50', 7'x50' and 8'x50'.
Semi-indirect heat Dryers—5'x30' and 8½'x75'.
Cement Kilns—3' up to 8' diameter.
Hardinge, Marcy & Fuller-Lehigh Mills.
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Vibrating Screens—Air Separators.
1—4'x4' and 8'x6' ball mills.
New Dryers built for all purposes.

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No. 80 Austin-Western Portable Crushing & Screening Plant.
36x60" Fairmount & 18x24" McLanahan single roll Crushers.
Traylor 36x30" double roll & type TY Reduction Crushers.
Superior 13, Kennedy 19, 258 & 36, Allis C 6' & 9 and Traylor 12x40" Gyratory Crushers, 2' Symons Cone.
8x36" & 15x36" Universal and 10x30" Champion roller bearing Jaw Crushers.
Two 6'x12' Ball Mills, silex lined with balls and drive.
Barber-Greene Loaders 24, 25, 42 & 82.
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Ask for Bulletins 54 and 55
MID-CONTINENT EQUIPMENT CO.
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One (1) Model 32 Marion Steam Shovel mounted on full crawlers, inspected boiler, good operating condition, attractively priced.

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Melrose 5-4800

Universal 20"x36" portable rock plant, roller bearing, double roll secondary, rubber tired, almost new.
⅜ yd. three-quarter swing Unit shovel. Weight 8½ tons.
¾ yd. full swing Byers shovel, model 66.
1 yd. Marion, steam, dragline with bucket.
1½ yd. P&H shovel, model 700.
240 cu. ft. Gardner-Denver Portable Compressor with tools.
10" Newhouse Reduction Crusher with 100 HP electric motor.
20" Sup. McCully Gyr. Crusher, both good as new.

M. WENZEL, R. 5, 5322 Aberdeen Rd., Kansas City, Kans.

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1—1302 CFM I-R class PRE-2, dir. con. synchronous motor, 125 ≠ pr.
1—693 CFM C-P class VC, vert., arranged for motor drive, 100 ≠ pr.
3—485 CFM I-R class ERI, single stage, horiz., belt dr., 50 ≠ pr.
3—603 CFM I-R class POC-2, 125 ≠ pr., diesel engine 17" bore x 19" stroke.
16—Portable Air Compressor, 110 to 310 CFM, gasoline and electric driven.

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We Own and Offer

1 Deane Bros. Triplex Pump—7x8x8 in condition equal to new, at reasonable price.

Also 50,000 gallon metal tank on 75' steel tower.

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DEPENDABLE USED MACHINES

P&H 206 shovel; exc. condition.
Universal ⅜ yd. shovel; $1600.
Sullivan 110 ft. compressor; rebuilt.
Several new V-belt pulleys.
40 ft. bucket elevator; buckets 13x7x6.
Butler 75 ton bin; just like new.
B-G 18 in. by 25 ft. port. conveyor.

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800 Cast Iron 45 Per Cent Pallets for Miles Stripper Machine.

BATTLE CREEK CONCRETE PRODUCTS CO.
Battle Creek, Michigan

LIDGERWOOD ELECTRIC SINGLE DRUM HOIST

22 HP., 3 Ph., 60 Cy., 220 V.
Also Cars, Buckets, etc.

THE INDUSTRIAL EQUIPMENT CORP.
P. O. Box No. 1647, Pittsburgh, Pa.
Warehouse: Carnegie, Pa.

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1—Skip Hoist—Bartlett and Snow—82 H.P. 2 Car—Automatic—Will Raise 150 Ton per Hr. 100 Ft. High.

A. J. CLEMENTZ'S SONS
233 1st St., S. W. Massillon, Ohio

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8-B Telsmith primary crusher, high speed shafts and roller bearings. Good condition.
¾ yd. Brownhoist combination crane and shovel.
5 yd. Austin-Western rubber-tired scoop.

COOGAN GRAVEL COMPANY
805-b Lehmann Bldg. Peoria, Ill.

FOR SALE

WIRE ROPE
(Used—Graded)
Imp. Plow Steel with Hemp and IWRC 1" and 1⅛" Dia.
STANDARD MAKES
Write for Particulars
"Large Stock 6 x 7 Sandlines"
GARRY CABLE COMPANY
28 W. 15th St. N. Y. C.

FOR SALE

Two 100 HP Allis-Chalmers, squirrel cage motors, 60 cycle, 3 phase, speed 680-720.
One Frankie coupler with 64 inch shaft.
One 10 inch semi-steel pump in very good condition.

RIVERSIDE GRAVEL COMPANY
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NEED DUMP CARS?

Immediate Delivery:
1. 30-yd. Clark, d/t doors
8. 24-yd. Koppel
13. 20-yd. Koppel
7. 20-yd. Western
24. 16-yd. Western
15. 16-yd. Kilbourne & Jacobs
Illustrated specifications available
OTHER TYPES OF CARS TOO.
Also Locomotives, Cranes, Shovels, Etc.

IRON & STEEL PRODUCTS, Inc.
13490 S. Brainard Ave., Chicago, Illinois
"ANYTHING containing IRON or STEEL"

FOR SALE

1—Model 4½ Type B, 23 ton capacity McMyler-Interstate Railroad Crane, powered with Ford V8 motor. Operating daily and can be seen at:

BROWNTOWN SILICA COMPANY
Browntown, Wisconsin

FOR SALE

One Model 502 Lima dragline. 50 ft. boom.
One and one-quarter yard drag bucket. Extended cats (16'x28"). Caterpillar Diesel engine. High gantry. About 5 years old. Located north central Illinois. ADDRESS:

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OLIVER FILTERS

3—Oliver Rotary Continuous Filters, 8'x10', wood stave, closed steel head, steel trough, oscillating agitator, reduction gear drive, no motor, complete with receivers, pumps.

GYRATORY CRUSHERS

1—16" Telsmith No. 7.
1—30" Superior McCully.
1—20" Superior McCully.

GYRATORY REDUCTION CRUSHERS

1—1'8" Traylor TY.
1—410-TZ, capacity 150 t.p.h. through 1¼" square mesh; 10" feed opening.
1—Kennedy No. 25 with motor in pulley.
1—Kennedy No. 49 with motor in pulley.
1—Kennedy No. 19, V-belt drive.

JAW CRUSHERS

66x86 Traylor; 36x24 Farrel; 24x36 Allis-Chalmers; 8x36 Universal Roll Jaw; 18x30 Allis-Chalmers and smaller sizes.

ROTARY DRYERS, DIRECT HEAT

Ruggles-Coles, double shell: 5'x26', 5'x30', 6'x35', 5'6"x60', 80'x45'.
Single Shell: 4'x30', 5'x30', 6x30, 6x50, 6x60, 7'x80', 8x60.

ROTARY KILNS

6'x60', 8'x110'.

2—6'x12' ROD MILLS

Hardinge straight side Rod Mills, iron lined, herringbone steel gears, enclosed gear drive units, charge of rods with each mill. Arranged for peripheral or trunnion discharge. In excellent condition and for immediate shipment.

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32"x15" Penna, SX-2, 4x1" hammers, adj. grate.
36"x24" Gruendler No. 4-A, 60—3"x1" hammers.
24" Mikro Pulverizer No. 4-TH, stirrup hammers.
No. 5 Williams Roller Knife Shredder, 40"x30".
No. 4 and No. 6 Williams "Jumbo".
20" dia. x 24" Dixie, direct conn. 40 H.P. A.C. motor.
24"x20" Jeffrey Type B-2 Shredder.
30"x24" Stedman, Model "A".
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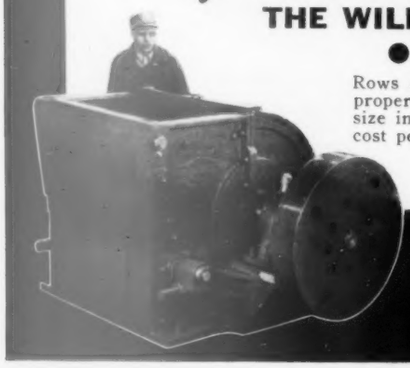

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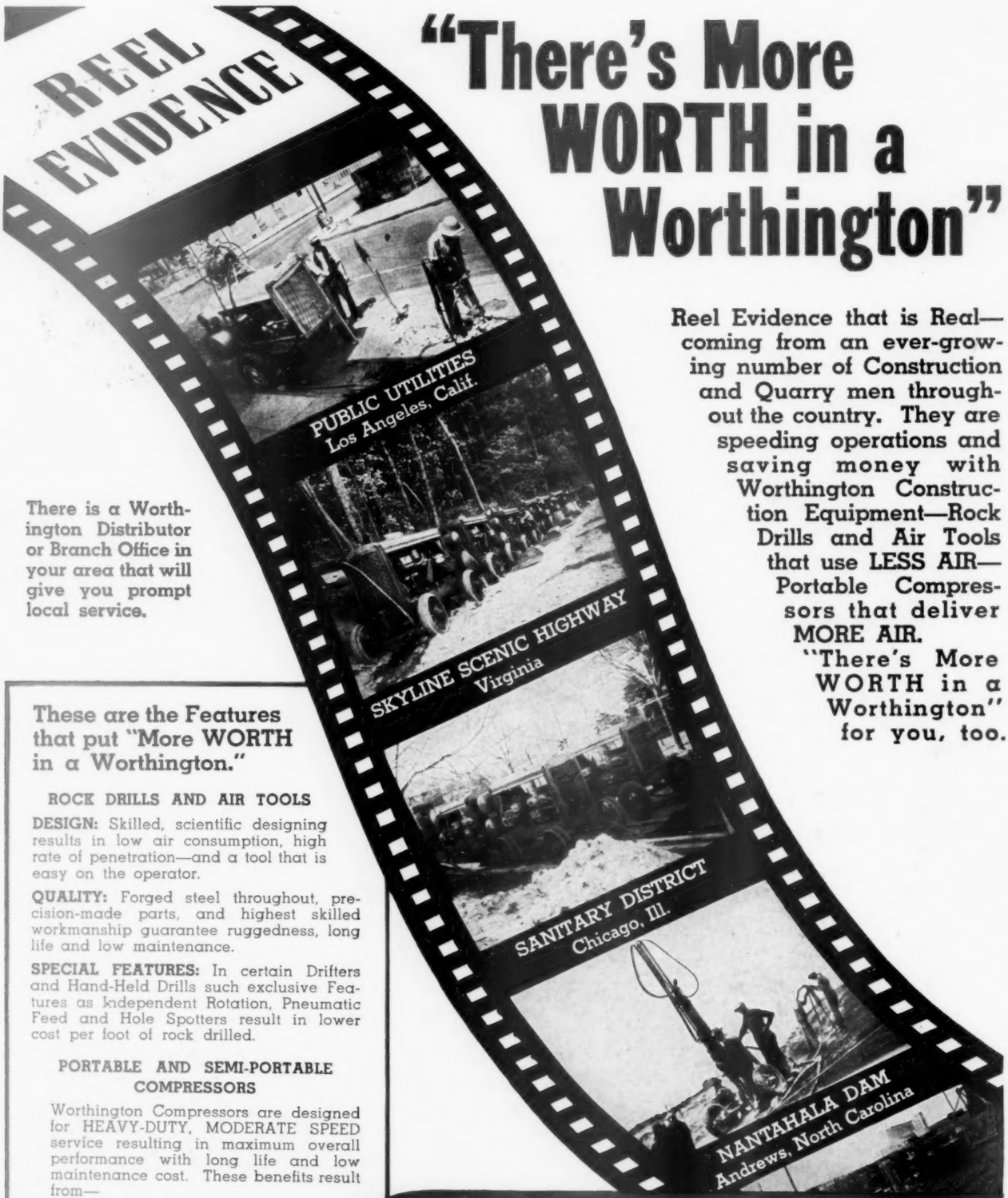

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